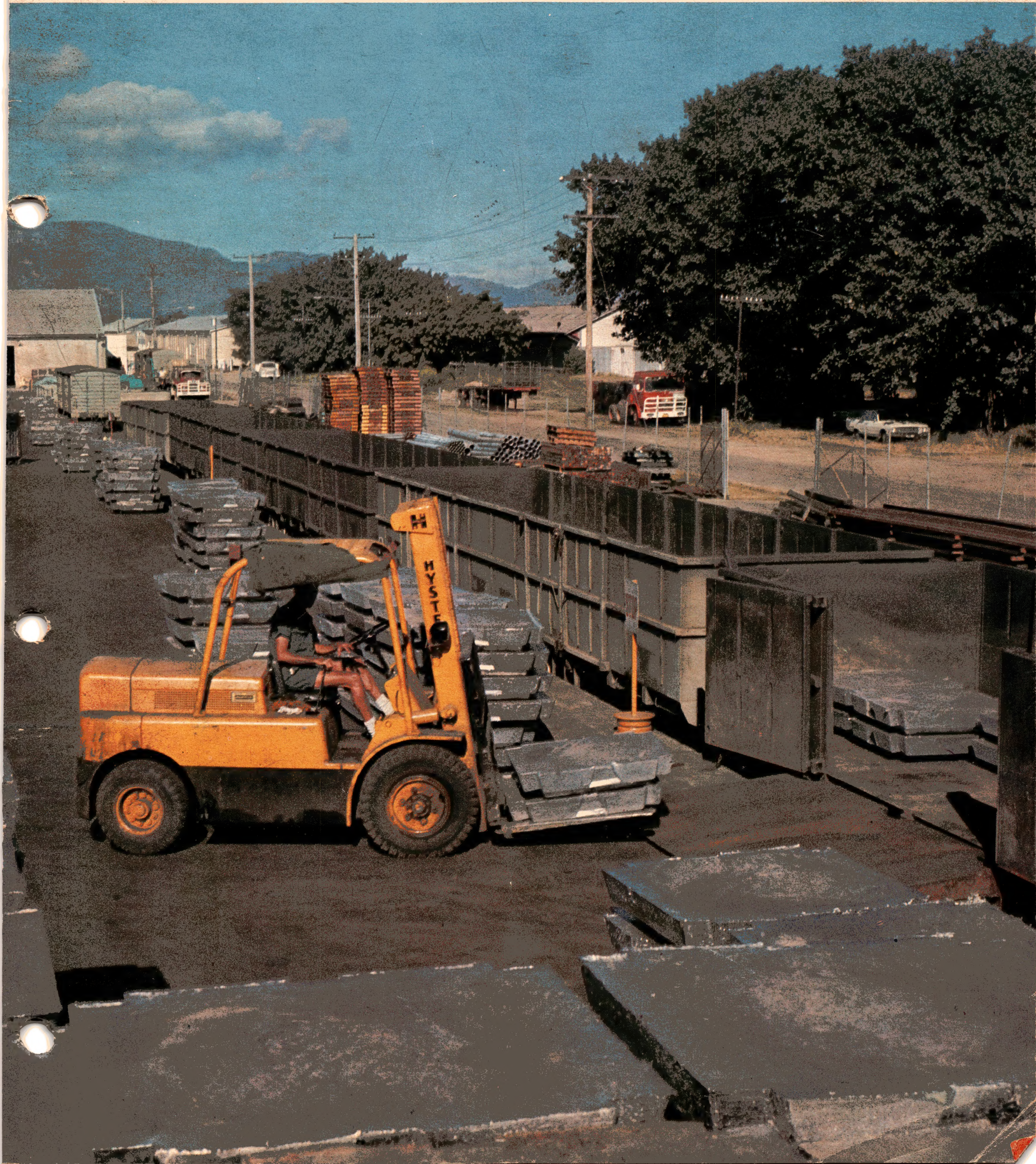
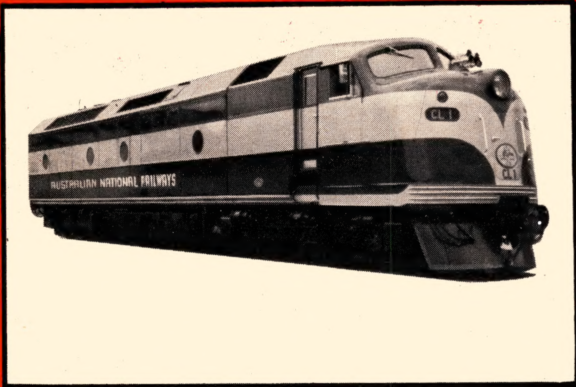
Railways of Australia

NETWORK

Vol. 15 No. 5 June 1978 Price: 50 cents





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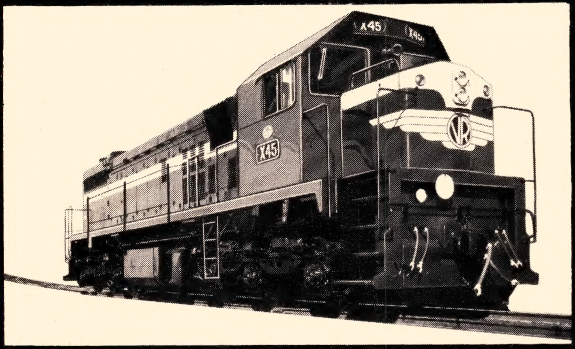

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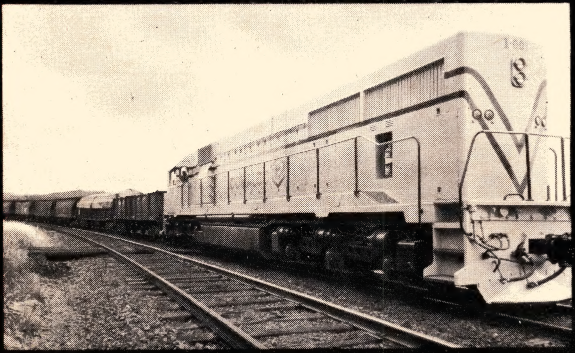

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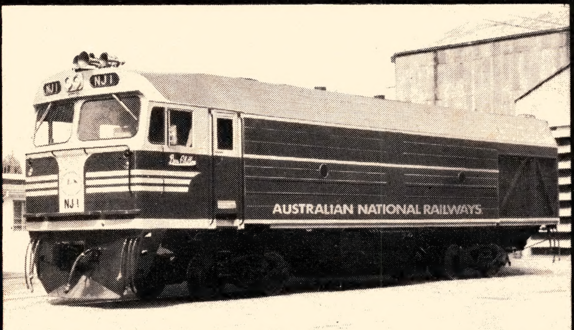

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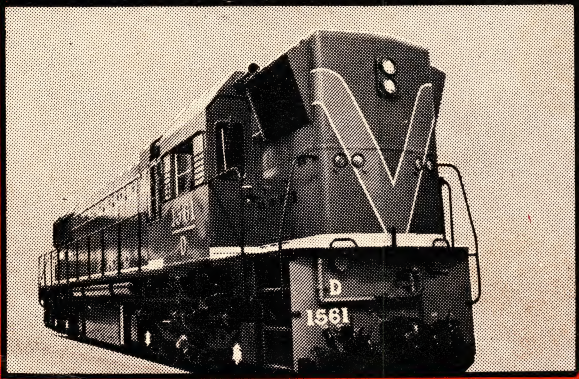

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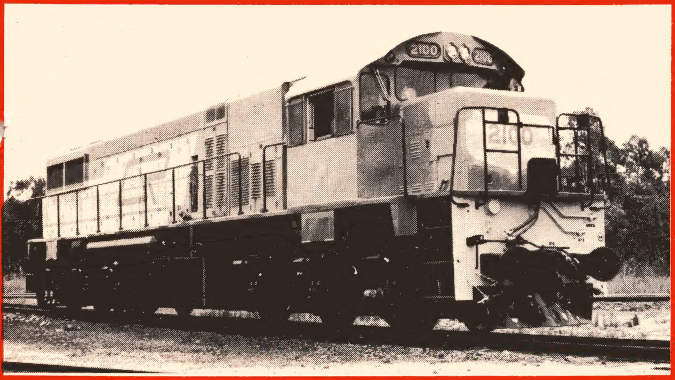
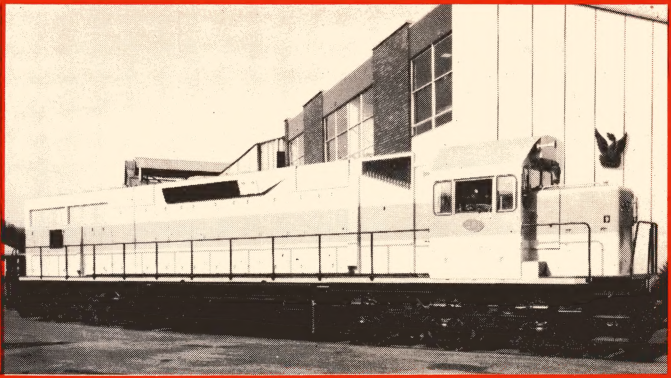


Q.R Model GL26C 2200/2000 HP



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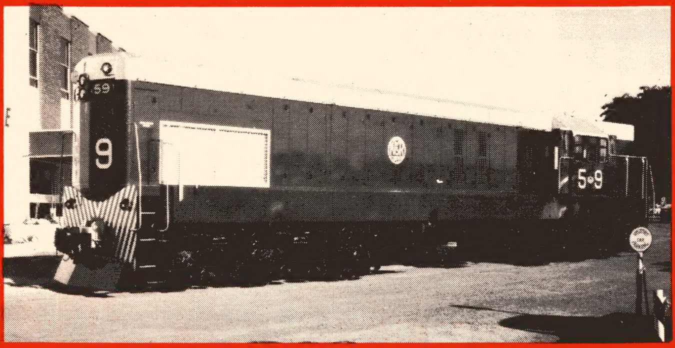

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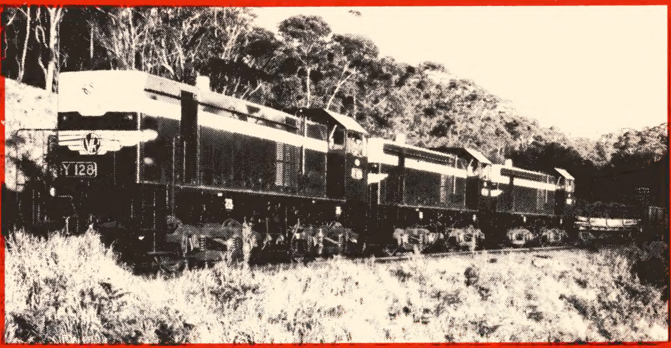

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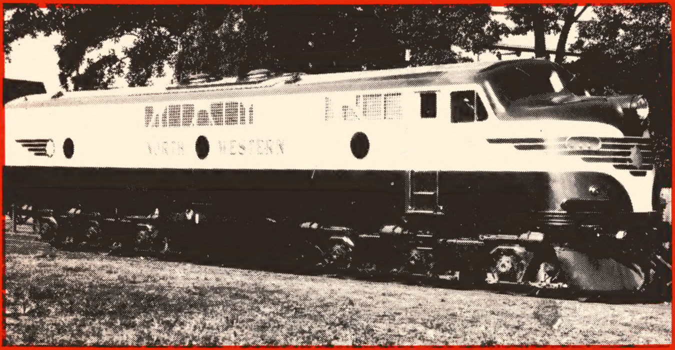

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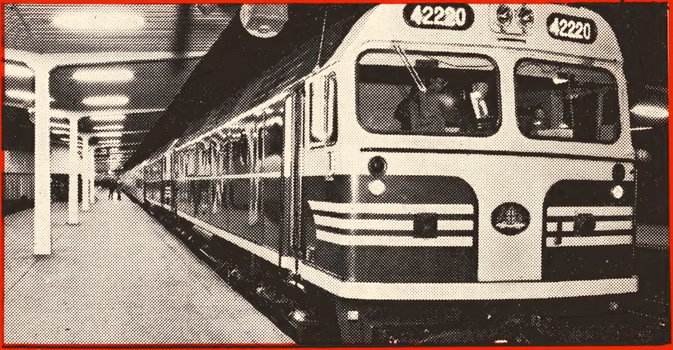

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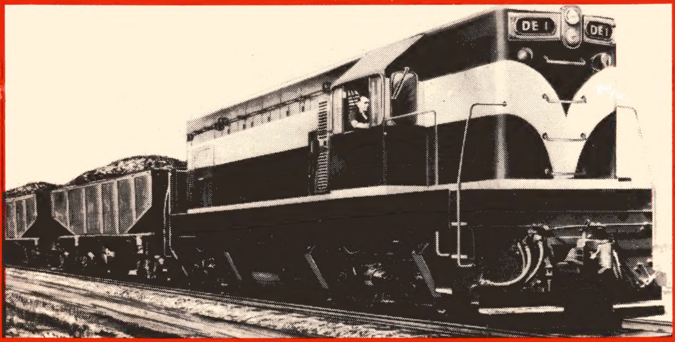

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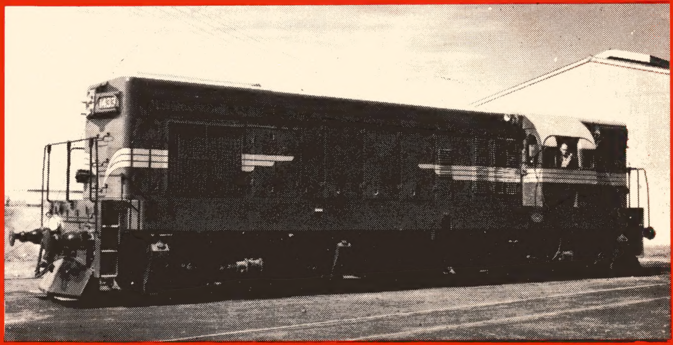

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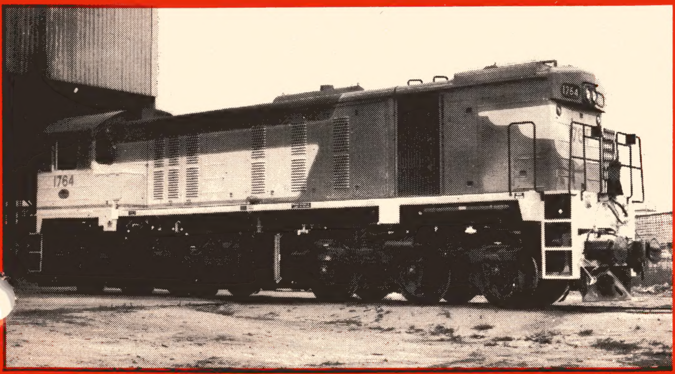

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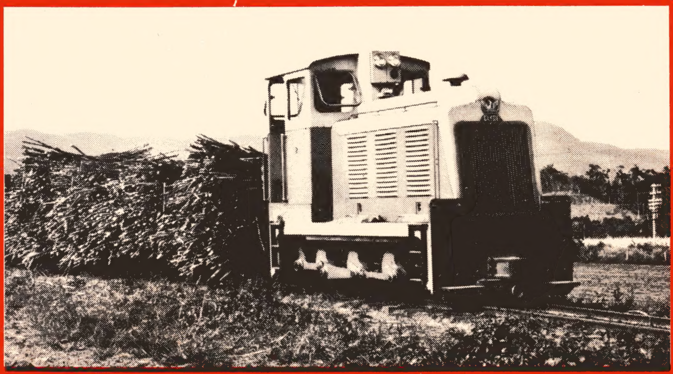

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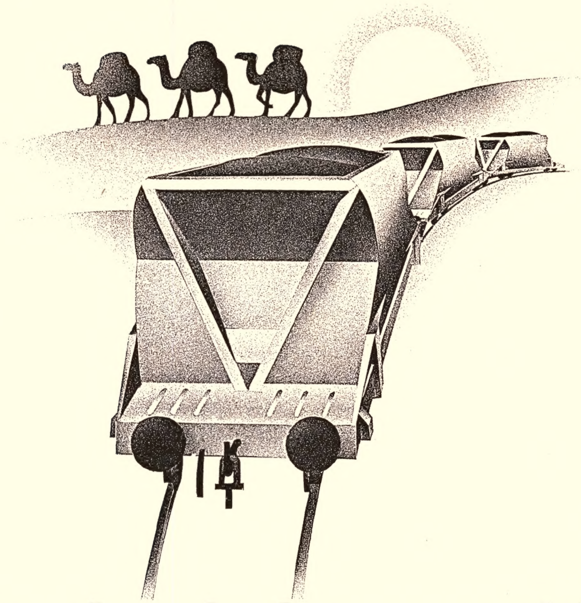

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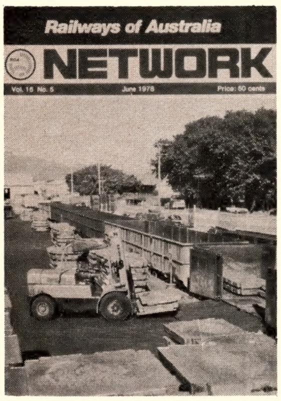
Railways of Australia

NETWORK

Vol. 15 No. 5 June 1978



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- Queensland Railways
- Victorian Railways
- Western Australian Government Railways

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OUR COVER

Unloading silver lead at Townsville (see "The Land Line to Mt Isa" — p.11)

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Railways of Australia
NETWORK

From the Executive Director's Desk

Who's the Boss?

Many people have a misconception of "Who is the boss?".

There is only one boss and no matter what your particular skill, trade or profession is, the boss remains the same — *the Customer.* He is the person who buys your product — he is the person who keeps you in business and consequently he is the person who pays your salary or wage, buys your home and car, educates your family and, amongst numerous other things, pays the grocer's bill — and he does that in proportion to the way you treat him.

Even though we may work deep inside the workshop or at the manager's desk, we are still working for the customer who buys the product at the end of the line — and he will withdraw this custom if the product does not suit his requirements. Therefore pride in our work and our output is absolutely necessary if we are to stay in business.

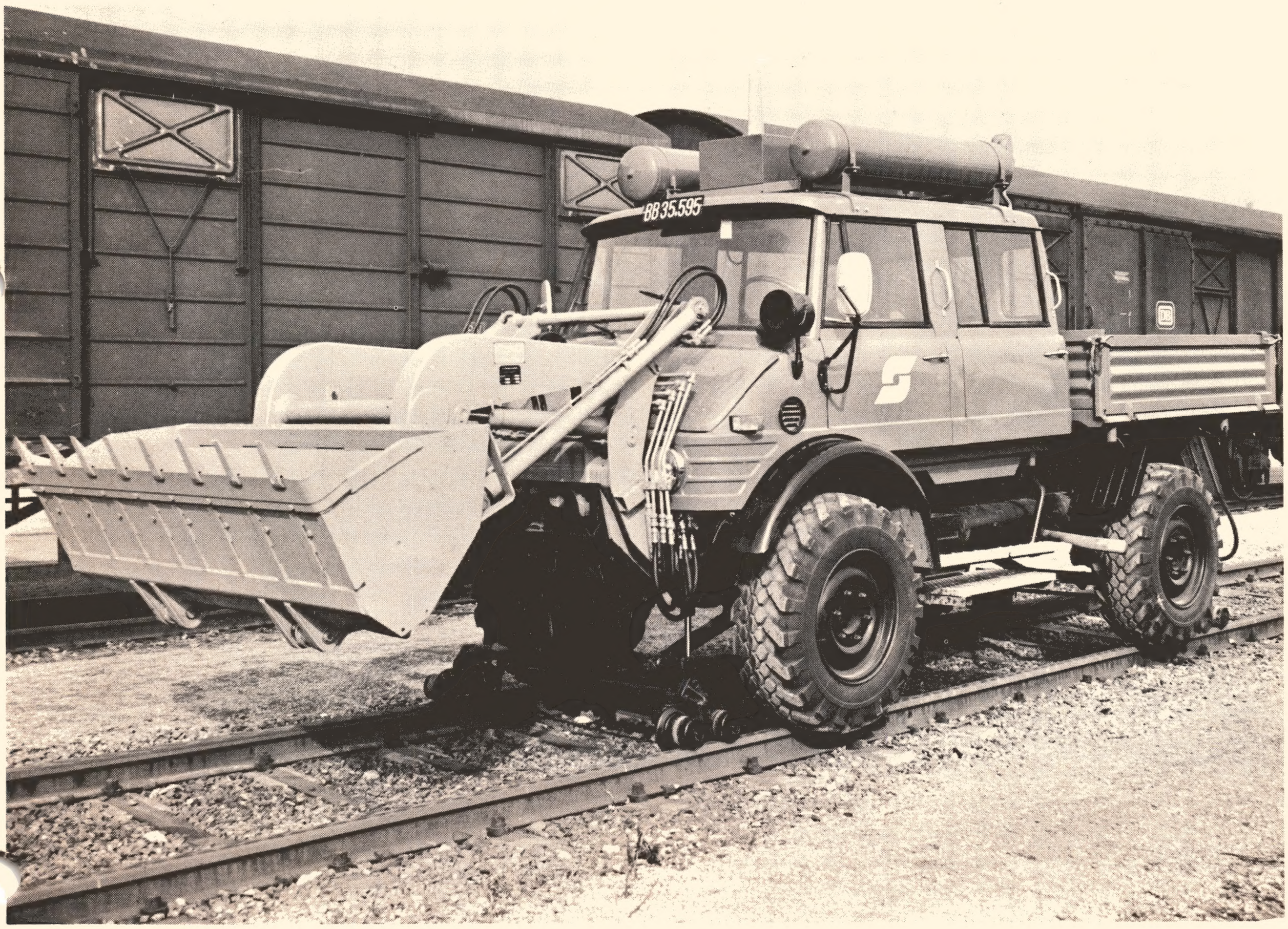
Even though some of us may consider that we are protected by the safety fence of Government employment, we can be so wrong. Railways are not just in Railways — we are in the transport business where competition is fierce. Our product is transport and service is the glossy and attractive package that catches the customer's eye. If he decides not to buy, our product is no longer required — and neither are we — but our pay packet is.

We cannot hide, we cannot escape, we are exposed to the dangers of inefficiency and lack of effort.

If we are to survive we must, by sheer effort, produce and satisfy the customer.

Always remember who is the boss.

B. M. HOGAN
Executive Director



Load-testing on an Austrian Railways bridge.

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In the Heart of Europe — Austrian Railways Today

The reconstruction of the Austrian Federal Railways after World War II involved enormous outlays and investments; three-quarters of all tractive stock as well as half of the passenger and freight stock had been destroyed or immobilised; destruction of bridges, stations and other installations was widespread; two-fifths of the network could no longer be used.

Reconstruction was a major preoccupation of the Austrian Railways during the fifties and sixties, followed by sustained efforts to modernize and rationalize operations and administrative structures. Today, with some 70,000 employees, Austrian Federal Railways are not only Austria's biggest employer but also the most important purchaser in the country; every year the Stores Department places orders worth some three milliards of Austrian shillings.

In a territory approximately one per cent of that of Australia, the Austrian Federal Railways route network extends to 5900km. Of this, only 14 per cent is on level terrain, and more than a quarter of the rest has grades in excess of 1 in 100. Although a wild and romantic mountainous setting may give great pleasure to the traveller, it involves stupendous technical and financial problems of railway construction and maintenance. In addition to the surveillance of 10,285km of track more than 15,200 switches, and approximately 1600 traffic points, Austrian Railways must maintain 5100 bridges and viaducts, 250 tunnels and galleries, many retaining and revetment walls, and track protection structures to guard against land-slides, avalanches and floods.

At the beginning of 1978, when the last steam locomotive services were withdrawn, almost half of the lines operated by the Austrian Federal Railways had been changed over to electric traction. These were the lines on which about ninety per cent of all traffic, expressed in terms of gross-ton-kilometres, was carried.

Modernization of rolling-stock and the introduction of efficient and reliable services to meet customer's changing needs are essential pre-requisites for increasing both passenger and goods traffic and countering road competition. With the "inter city trains", quick and comfortable connections have been introduced between Austria's bigger cities and, in collaboration with the Austrian Travel Agency, Austrian Railways offer the new "motorail" services between Wien Sudbahn-hof and some of the well-known Yugoslavian and Italian holiday resorts along the Adriatic coast.

As part of a continuing modernization programme, Austrian Federal Railways have a hundred international passenger coaches under construction in collaboration with EUROFIMA, together with fifty European passenger coaches (called RIC-coaches) and eighty internal passenger coaches ("Schlieren" type). During recent years, about 400 cars of the last-mentioned type have been put into service, and approximately 9000 new freight cars have been purchased. A thousand flat wagons — known as "wagons with stanchions" — are also on order.

At the end of 1977 the rolling-stock consisted of 659 electric and 504 diesel-locomotives (with 63 steam engines for maintenance reasons), and 4640 passenger coaches and baggage and mail cars. The tractive stock includes ten thyristor-locomotives, five of 24

New-style dining car.

newly-ordered thyristor-locomotives having already been supplied. In order to compete with heavy road traffic, the Austrian Federal Railways are concentrating especially on container transport. Container terminals are under construction at the main goods-stations, and there has been a steady increase in container traffic.

A significant portion of the Railways' budget is used for the improvement of security installations, including modernized signalling and electric signal boxes with push-button control.

Automatic train-stopping services (INDUSI) have been systematically introduced on all main-line tracks since 1964; and the first service trials of radio-communication have recently begun on the Tauernbahn, one of the most heavily-used tracks in Austria.

In the telecommunication service, the automatic railway-telephone system (BASA), which makes possible auto-selective communications between single offices, has been changed to a more modern system. A common telex and data transmission system has been constructed, controlled by a computer. In 1973 the first notifications of internal freight wagons were transmitted from border stations directly to the new computer centre in Vienna.

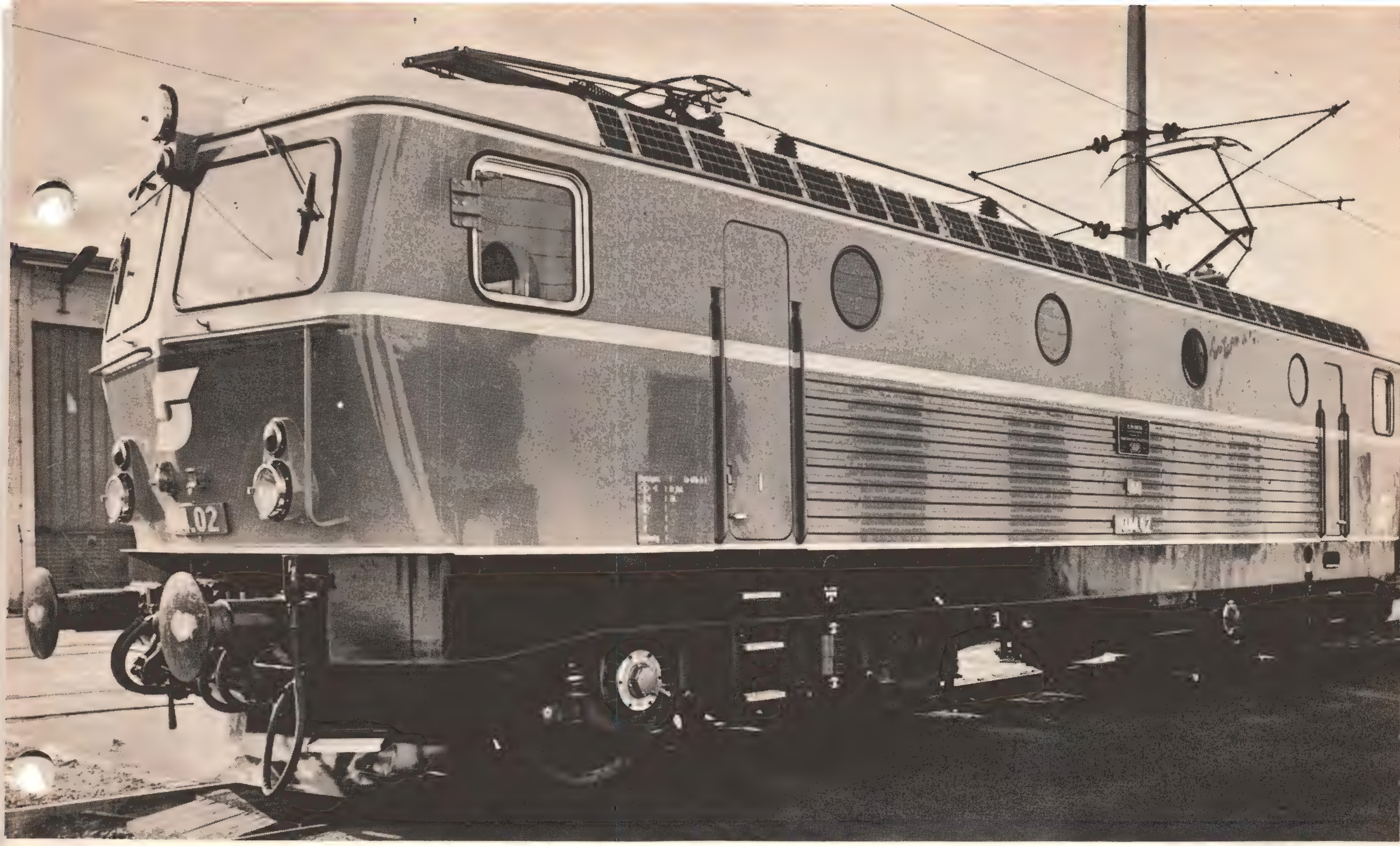
Every year the Austrian Federal Railways transport approximately 170 million passengers, and in 1977 it was possible to see an upward movement in the passenger traffic. About one fourth of the passengers are carried on the Viennese Schnellbahn, which serves Vienna and its immediate environs.

The Austrian Federal Railways also form part of a dense network of international communications, and carry through carriages to and from all important cities on the continent. In April 1972, they introduced the electronic seat-reservation system, using the data processing centre installed by the German Federal Railways in Frankfurt, to which the Austrian and eight other European railway administrations are connected. Every year the Austrian Federal Railways reserve approximately two and a half million seats, using this system

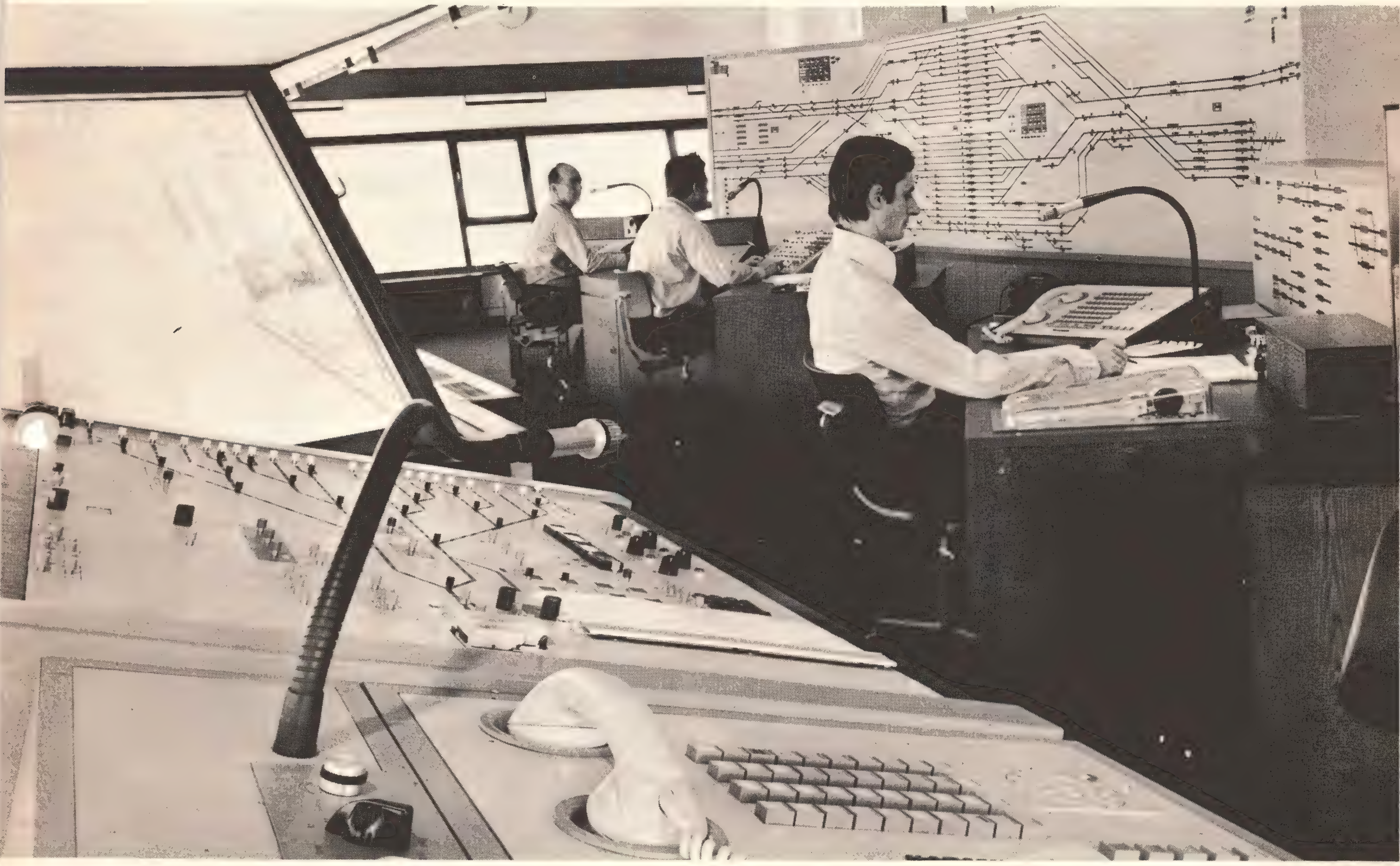
Freight transport totals some 50 million tons annually. A little over five million tons represent goods imported, approximately the same amount represents goods for export and eight million tons are made up of transit traffic operating between no less than 23 frontier points; the rest, about 32 million tons, is internal traffic. In the freight area, Austrian Federal Railways run about 36 million train-kilometres and approximately 35 milliards of gross-ton-kilometres a year.

Recent developments include twenty so-called "Nachtsprungverbindungen" ("night-leap-connections"), express and fast freight trains running between Vienna, regional and industrial centres, and the various frontier stations. In the international freight service, Austrian Federal Railways participate in the TEEM (Trans-European Express-Merchandise) Traffic, a network which has grown rapidly during recent years, both in Austria and Europe generally.

Austrian Railways have also established extensive motor services which, in 1977, carried some 90 million passengers (including school pupils who are carried to and from school free) and more than a million tons of freight.



Thyristor locomotive (above); Centralized control point (below).



Like many other systems, Austrian Railways perforce endeavour to carry out their obligations under unremunerative conditions; rates are fixed by the legislative assembly ("osterreichische Nationalrat"), while the Railways are expected, and required, to operate according to recognised business principles as laid down by various Federal Railways Laws.

Fortunately, in Austria as elsewhere, there is growing awareness of looming limitations of fuel resources and of the twin problems of pollution and road congestion. More and more people are becoming aware that viable rail transport is an indispensible necessity in a modern community.

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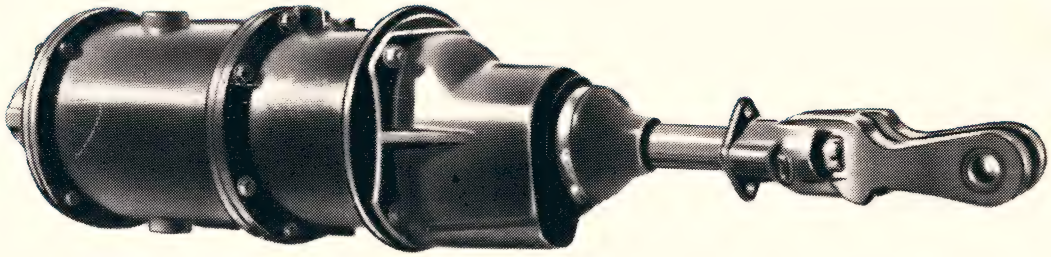

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The Landline to Mount Isa

The Inlander — Townsville-Mt. Isa.

Among the biggest customers of the Queensland Government Railways is Mount Isa Mines Limited which, together with other users of rail services in Mount Isa, is responsible for extremely heavy two-way traffic on the 970km Great Northern Line between the mining city and Townsville on the coast.

Products from Mount Isa in the shape of metal ingots and mineral concentrate provide the bulk of outward railings although cattle shipments are also significant. Coal from Collinsville to the Mica Creek Powerhouse is the biggest single commodity railed into the Isa, but freight trains carry a variety of general goods to sustain the city which has its genesis solely in the mining industry.

While revenue earnings for Queensland Railways from the Mount Isa traffic are very high, there is also a huge outlay to railway workers in centres small and large along the entire length of the State's longest inland railway line. In fact, the Queensland Railways payroll plays a very important role in the economic life of many centres, largely because of the development of the mining industry in Mount Isa.

One should not forget of course, the substantial livestock industry which has been responsible for much of the pioneering spirit of the people of the north-west.

To keep pace with increasing haulages over recent years, the Railway Department has carried out impressive improvements by upgrading the track and providing modern facilities.

The biggest single improvement was the reconstruction, at a cost of $54 million, of the line between Collinsville and Mount Isa in the first half of the sixties when Mount Isa Mines was embarking on its expansion programme.

At the time, this was one of the world's major railway projects.

It included the largest number of pre-stressed concrete bridges to be built in a single rail project (144, with an aggregate length of 7000 metres).

Since then the Queensland Railways has carried out many improvements to handle the increasing traffic on the Mount Isa line. These have included the establishment of bulk handling facilities, new stations and accommodation, and a continuing programme of track upgrading.

Last financial year saw substantial relaying with heavier tracks, strengthening and improvement of existing trackwork and formations, regrading, and insertion of sleeper plates.

New pre-stressed concrete bridges now stand at Warrigal and Bullock Creeks and new reinforced concrete box culverts have replaced timber bridges at seventeen other sites.

For the next three years, an allocation of more than $6 million has been made for track improvements, including the replacement of remaining wooden bridges and further extensive relaying with heavier line, particularly on the Mount Isa-Duchess section.

In keeping with the policy of upgrading quarters for trainmen, amenities for employees, and accommodation for migratory gangs, new premises have been built recently at Torrens Creek, Duchess, Gilliat, Cloncurry and Hughenden on the Great Northern Line.

The advantages of the diesel locomotive are clearly demonstrated on the long hauls between Mount Isa and Townsville. Previously, in the days of steam power, many changes of locomotives were required on this testing journey. Today, diesels make the run unchanged.

The Northern Railway Division was the first in Queensland to be operated completely by diesels, and it served as a pattern for similar changeovers in other divisions.

Freight trains running between Townsville and the west were the forerunners of the unit train technique which has been developed to a remarkable extent in Queensland in recent years.

As loads became heavier, it was decided to run diesel locomotives in multiples of two and three to haul long trains of up to some 4000 tonnes in weight.

Special wagons have been developed. Sixty-two tonne gross capacity wagons were designed for the haulage of mineral products from Mount Isa to Townsville, and, on the return journey, coal from Collinsville for the Mica Creek powerhouse.

Other dual-purpose wagons are used for the haulage of bulk cement from Townsville and for mineral ingots which are mounted on end platforms for the return journey to the coast.

Air conditioned "Inlander" passenger trains provide comfortable travel twice weekly between Townsville and Mount Isa. These trains link with the "Sunlander" in Townsville to enable passengers to make the connection for the south.

Mechanised maintenance of the permanent way was introduced on the Great Northern Line in the 1960s to maintain the line at high standard and also to offset a general labour shortage in western areas.

The Queensland Government Railways, which has become a proud partner in the progress of Mount Isa, a pyramid of stability within the Australian mining industry, plays a vital role in the economic transport of minerals from many parts of the state.

Top: Loading zinc at Mt. Isa.

Centre: Phosphate train on the Great Northern Line.

Below: Unloading silver lead in Townsville.

Signalling & Telecommunications Developments around Picton

New control centre under construction at Picton, WA.

The South-West main line from Perth is single line from Armadale (30km) to Bunbury (185km). In the early 1950s, proposals were made to replace the Electric Staff system from Armadale to Brunswick Junction (159km from Perth) with colour light signalling and continuous track circuiting, controlled from a Centralised Traffic Control panel in Perth. Implementation of this plan began in 1956, but before it was completed, the number of trains using the line had decreased as a result of a decline in coal traffic coupled with dieselisation of motive power. It was decided to instal the new signalling only as far as Coolup (98km) and this was completed in 1960.

Recent increases in coal and alumina traffic have brought the Electric Staff system between Coolup and Bunbury close to saturation point. Accordingly, new plans have been developed for installation of colour light signalling and continuous track circuiting over the section, controlled from a new Centralised Traffic Control panel at Picton, near Bunbury. In addition to control of the Coolup-Bunbury section, the new centre has been planned to control the Picton to Bunbury Inner Harbour line (5km), Brunswick Junction to Collie line (40km) and the lower South-West line as far as Boyanup (18km from Picton).

The first stage of this project was completed early in 1976 when the Picton-Bunbury Inner Harbour section was signalled and controlled from a temporary panel in Picton Junction signal box.

A new triangular junction has been constructed at Brunswick to enable trains to and from Collie to proceed directly to Perth without necessitating reversal at Brunswick Junction and this is shortly to be signalled with temporary control from Brunswick Junction signal box. This section will see the first general use of impulse-type track circuits operating over approximately 7km, following trials of the equipment in the Kalgoorlie area over the past twelve months.

The use of these impulse track circuits will be extended later to all the single-line block sections between crossing loops on the Coolup-Picton section. It is also proposed to employ audio frequency overlay track circuits for operation of flashlight or boom-gate installations at protected level crossings which exist within the single-line block sections.

The opportunity has been taken on this project to replace all aerial wires with underground cable, resulting in improved security and a considerable reduction in annual maintenance costs.

Westrail

Picton Control Centre

Construction of the new control centre at Picton has been commenced and the building is due to be completed in August. Work will then begin on installation of the signalling and telecommunications equipment.

The signalling equipment in the operating room will comprise a large free-standing indication panel incorporating the track and signal layout. Each signal in the scheme has been designated a unique decimal number. A route is set by specifying the source signal and the destination signal to a small computer via a custom-designed terminal. The computer analyses the route request and acts accordingly. Through setting of routes is possible and route calls are cancelled automatically after the passage of a train.

The operators' panel is a small custom-designed terminal incorporating a 32-key keyboard and two 32-character alphanumeric displays. One display echoes operator

The new Brunswick triangle showing points and signals.

entries, the other provides error and diagnostic messages.

The microcomputer interacts with the operator via the terminal, scans inputs and updates outputs. At the completion of the third stage of the signalling project, the microcomputer will scan approximately 300 inputs and drive approximately 250 outputs. The inputs are voltage-free relay contacts which are scanned via 24 optically isolated receivers and 32 optically isolated drivers. The system can scan a total of 768 inputs without additional electronics. The outputs are addressable by the microcomputer under a memory map scheme. The custom-designed output boards contain 32 optically-isolated outputs per board. One output-type board will be dedicated to scanning inputs, four boards to driving relays and five boards to driving the telemetery system, making a total of ten boards The system is designed to drive a total of 256 output boards. However, in practice, the upper limit depends on efficient software management.

Picton-Coolup Signalling

On completion of the work at Brunswick Junction, the section from Coolup to Benger (149km from Perth) will be equipped with the new signalling, which will be the first portion of the scheme operated from the Picton Control Centre. Crossing loops will be provided at Coolup (98km), Waroona (110km), Yarloop (123km), Warawarrup (134km) and Benger. These loops will all be approximately 600 metres long, but they have been designed for extension to 1200 metres should this be necessary at a later date. Each crossing loop will have its own relay room and standby generator and will be controlled from Picton by remote control equipment operating over a voice frequency channel in the telecommunications cable.

Provision has been made in this section for eventual rail access and associated signalling to the Alumina refinery at Wagerup (117km).

Junction route indicators and position light shunt signals are to be introduced for the first time on Westrail in connection with the Picton-Coolup signalling project, whilst consideration is also being given to the introduction of some form of reflectorised marker disc which will take the place of purple marker lights currently in service throughout the system.

Following the Coolup-Benger section, additional signalling work will be undertaken at Brunswick to enable the temporary panel at Brunswick to be removed and the area controlled remotely from Picton.

Picton Area Signalling

Completion of the final signalling in the Picton area will involve laying of new trackwork to enable direct access from the lower South-West line to the Bunbury Inner Harbour line and from the lower South-West line towards Brunswick Junction. Installation of signalling will then enable the whole area including the Bunbury Inner Harbour line to be controlled from Picton Control Centre. At this stage Picton Control Centre will control the whole of the line from Coolup to Picton and will extend as far as Beela, 10km from Brunswick, on the Brunswick-Collie line.

Brunswick-Collie Signalling

The final major stage in the project will be the completion of signalling from Brunswick to Collie with a crossing loop at Worsley (21km), and will involve the closure of the crossing loop at Beela. On this section, provision will be made for future extension of signalling at Worsely to the proposed Alumina refinery nearby and for possible reopening of the crossing loops at Beela and Moorhead (31km).

Communications

As indicated above, opportunity has been taken to replace the overhead telephone-line system with a carrier quad cable system. The decision was based on the economics of reduced overhead line costs and increased future capacity and low maintenance of the cable carrier quad system.

The existing physical overhead communications line (circuit 68) carries a 12-channel carrier system from Perth to Bunbury in the spectrum 30kHz-160kHz with all-stations omnibus telephones to all intermediate points. The train control line (circuit 69) is utilised for train operations and controlled signalling functions from Perth and Bunbury.

This system will now be replaced by a V120 cable carrier system providing 120 VF channels from Bunbury to Pinjarra. The channel capacity will be utilised for various functions of communications, signalling and train control as required for the joint operation of this section of line.

The facilities incorporated in this scheme are as follows:

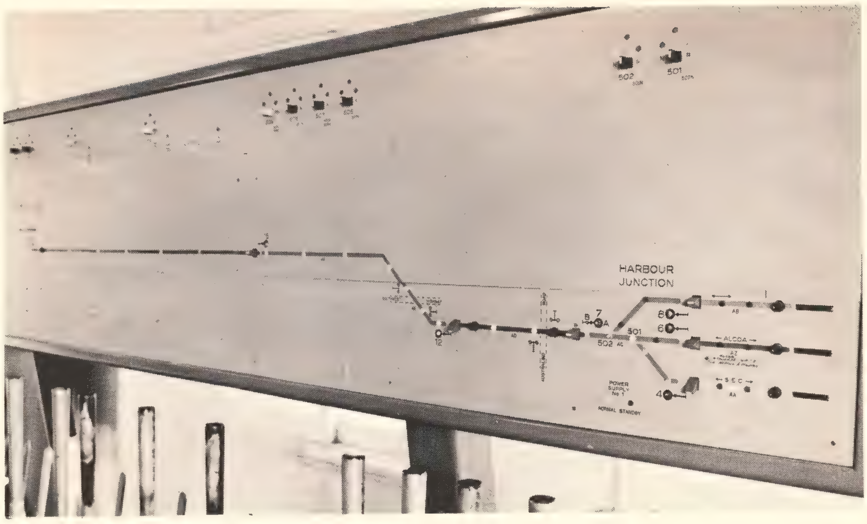
(1) **CTC** This signalling equipment will be operating on discrete VF channels within the V120 system and will operate on the lines indicated above in the description of signalling functions.

(2) **Radio** The radio system, although not yet an integral part of the system, will be a near future development. Specific VF channels in the V120 system will be allocated for the provision of a separate operations and service channel to give full radio coverage for the Bunbury to Pinjarra operational area. This would be achieved by the use of track-side radio-base stations controlled by VF channels in the V120 carrier system. Radio bases already exist at Bunbury and Pinjarra.

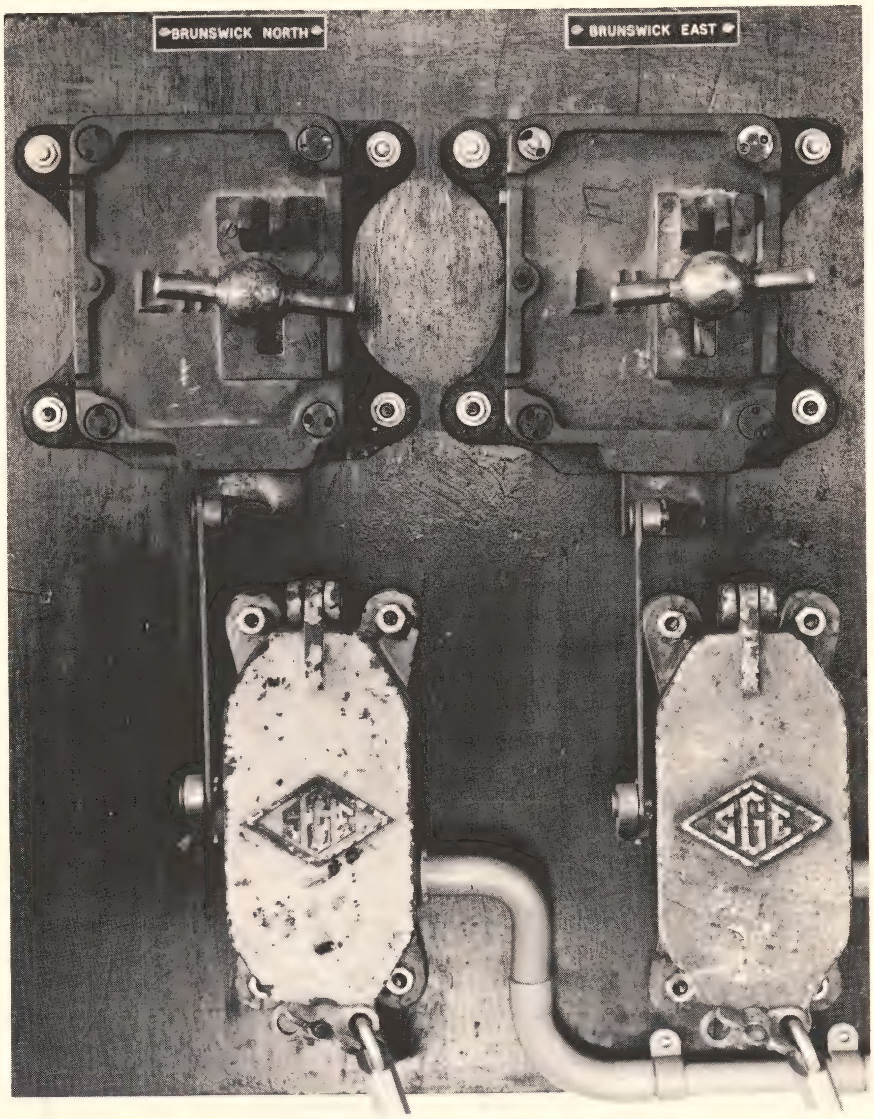
(3) **Train Control** The present overhead telephone line (circuit 69) will be replaced by a communications system integrated with VF channels on the V120 system. This alternative will eliminate the high noise level associated with the monitoring amplifier at present in use in the Westrail Train Control System. The present system will be replaced by one using low noise level with lamp indication and optional alarm for all incoming calls to the Controller.

The field units associated with this system will concentrate groups of telephone points used for operations into one display unit or even to individual display within the group as required. The degree of sub-division of these groups would depend on the economics of the need and limits of the proposed scheme. This would be evaluated to give maximum benefit to the operational requirement within the funds available.

The control points for this system would be dictated by the yards at locations along the route, with each yard or location having a group indicator back to the Controller desk panel. Selective call will also be provided in the same system whereby any telephone within the group can be selectively called, and operators can also speak to each other if required under the Controller's surveillance.



Temporary panel at the present Picton Junction signal box.



Temporary triangle control at Brunswick Junction box.

Telephones

Automatic dialling telephones will be provided back to the administration telephone exchange at Bunbury with automatic access to the Westrail network and operator-controlled access to the ATC network.

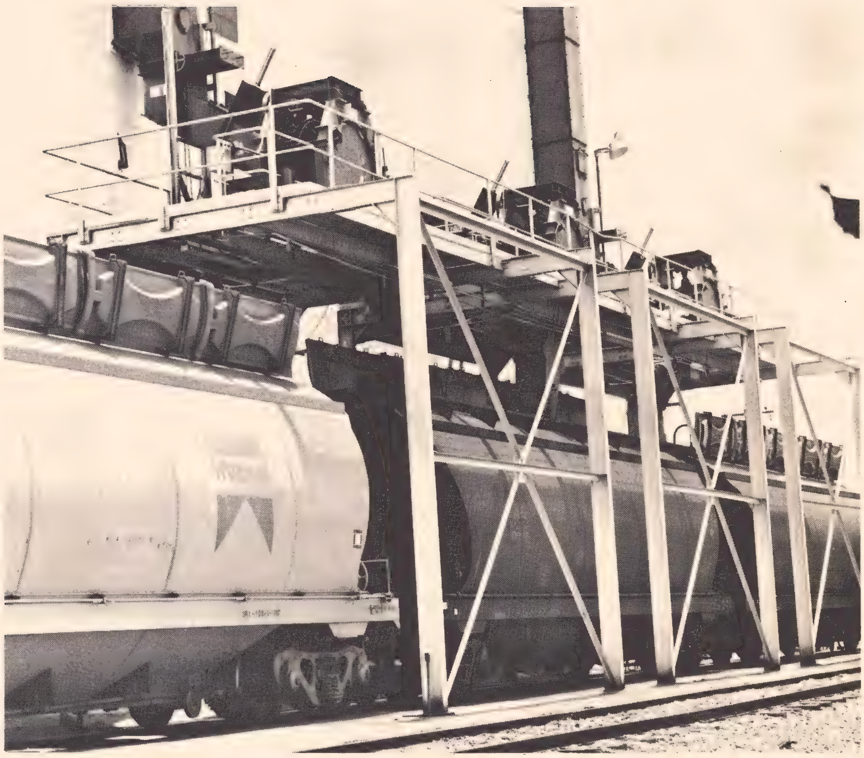
Additional facilities requested for traffic operations will include the following:

(1) Provision of T lights and telephones at stations and crossing loops where these locations do not coincide with the intermediate terminal points of the V120 system.

(2) Direct VF lines from the Train Controller, Picton, to the District Superintendent at Bunbury.

(3) Bunbury radio base will be under dual control from both Bunbury and the Controller at Picton, with continuous monitoring of all transmissions.

A grain train being loaded at the Co-operative Bulk Handling silo at Avon, near Northam. Movement of the harvest has virtually finished and just over 3 million tonnes have been hauled from country districts.



A woodchip unit train leaving the mill at Lambert, near Manjimup. To date, almost half a million tonnes have been railed to the coast this year for export through Bunbury.

En route to Meekatharra.

Westrail's freight service between Mullewa and Meekatharra has ceased operation. The last train bound for the Murchison district left Forrestfield on April 26, Mullewa on April 27 and Meekatharra on April 28.

The Mullewa/Meekatharra line, opened 68 years ago, was a key factor in the development of the Murchison goldfields. Today, the goldmining industry has disappeared, and the State Government decided last November to close the rail link in the face of reduced freight haulage and the condition of the track, which would have cost some $30 million to upgrade.

Freight carriage to the region will be maintained by road operator, Bellways Pty Ltd, who are accepting freight for the region between Mount Magnet and Meekatharra at their metropolitan depot in Belmont.

Other local carriers will maintain a regular road freight service between Geraldton, Yalgoo, Mount Magnet and Meekatharra.

There will be no reduction in the level of Westrail's current rail and motor-coach operation between Perth and Mullewa, via Wongan Hills and Morowa.

The present passenger motor-coach from Perth to Meekatharra and between Geraldton, Mullewa and Meekatharra will also be unaffected by the rail closure.

The railway line between Mullewa and Pindar will remain open for a period, on a seasonal basis, for wagon-load consignments.

A series of side-tipping wagons on loan from Australian Iron & Steel, are being tested by Westrail on formation widening on banks of the standard-gauge railway near Tammin.

Material for the project is obtained from the old narrow-gauge flyover banks south of Tammin.

Each 350-tonne train is then hauled six kilometres to the site, where each wagon is hydraulically unloaded.

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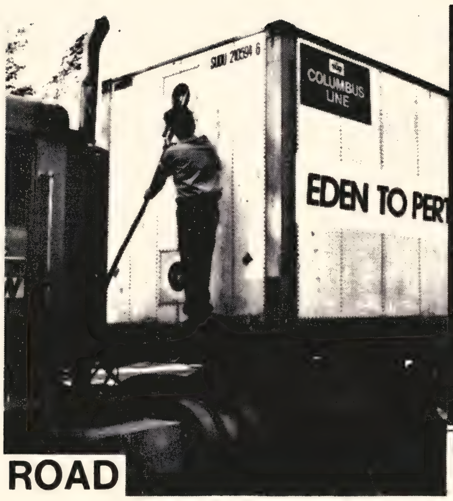
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Safety in Materials Handling

In May, VicRail launched a campaign to lessen the incidence of back injuries among the staff. An education programme was arranged to give specialized training as required, and a competition was conducted to get the ideas of the members of the staff most closely concerned.

All managers and supervisors were invited to attend a seminar at which guest speakers, Dr B. Grove of the Ford Company and Mr N. Helwege of the S.E.C., presented papers. In opening the seminar, Mr L. McCallum, Deputy General Manager of VicRail, told his audience that back injuries were one of the greatest problems among staff in industry generally and that VicRail employees were no exception. "Each year", he said "approximately 15% of our staff suffer an injury to the back which necessitates the loss of at least one shift from work".

In conjunction with the seminar, a Safety Exhibition and Materials Handling Display was held in the Melbourne Freight Terminal during 4-5 May.

The purpose of the exhibition was to bring together all available equipment in the field of materials handling, much of it already in use by VicRail, several items designed by VicRail employees, and other equipment supplied by commercial firms.

The display covered a wide range, from the sophistication of cranes and forklifts to the correct use of crow-bars, rollers and two-wheel trolleys; or, as exhibition guide, Vaughan Hayes, said, "from a piece of piping to a 58ft cherry picker".

Without doubt one of the most fascinating displays was the section devoted to sling manufacture, wire and rope. The men demonstrating their craft were surrounded as they showed the techniques of splicing, fixing crane hooks, and making repairs to frayed lengths of both wire and rope. It was a great display of old-time craftsmanship.

Among the uncomplicated items that caught the eye, there was a small hand-held magnet capable of lifting 300 lbs and of releasing its load at a simple reversal of the handle. There were also light-weight, easily moved conveyor belts of different types, always a big factor in the war against back injuries.

In demonstration of Zendel shrink film wrapping from Union Carbide, large polyethylene gusseted bags were torn from continuous rolls and placed over a pallet of goods. Using a hand-held heat gun, the operator then applied heat over the entire surface causing the bags to shrink to the conformation of the goods covered.

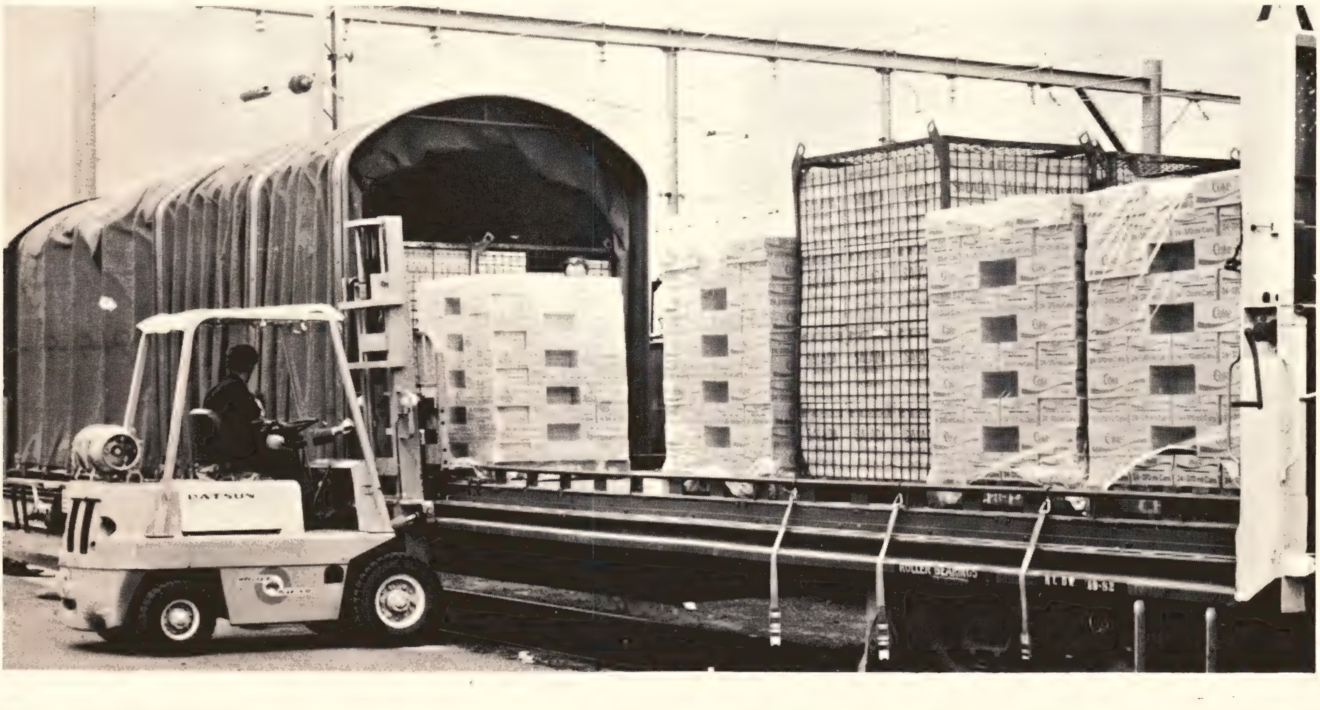
There was also a demonstration of stretch wrapping of a pallet of goods by Exthene Pty Ltd. The "Spiral Lanrapr" systems are designed to wrap successive loads of varying length, width and/or height with a single film size. The pallet of goods is placed on a turntable and revolves until the desired thickness of stretch-wrap film has been applied.

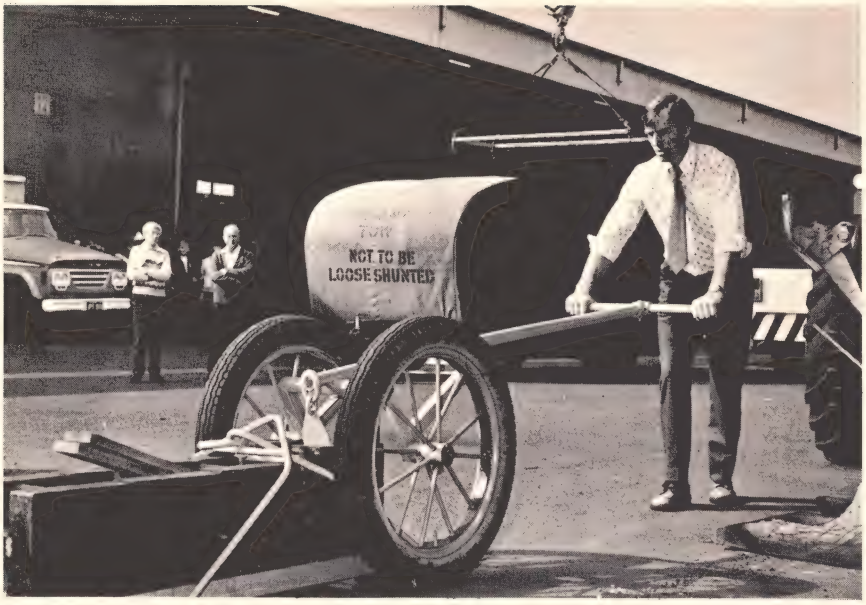
VicRail's "Prairie Wagon" was on display with its slide-along sides and roof and "covered" wagon look. It had been packed with a variety of goods to demonstrate yet another innovation — inflatable dunnage. In the form of various sizes and shapes of pillows, they proved an excellent protection, ballasting one type of goods from another.

Forklift trucks of every weight and for many purposes were on display: Mitsubishi, Yale, Sambron, Chep, Toyota, and a variety of accessories for use with forklifts such as the Long Reach — Bale Clamp, designed to carry the maximum number of bales on the smallest possible truck. When equipped with high-strength bale arms, a small forklift truck can carry up to nine bales of standard density.

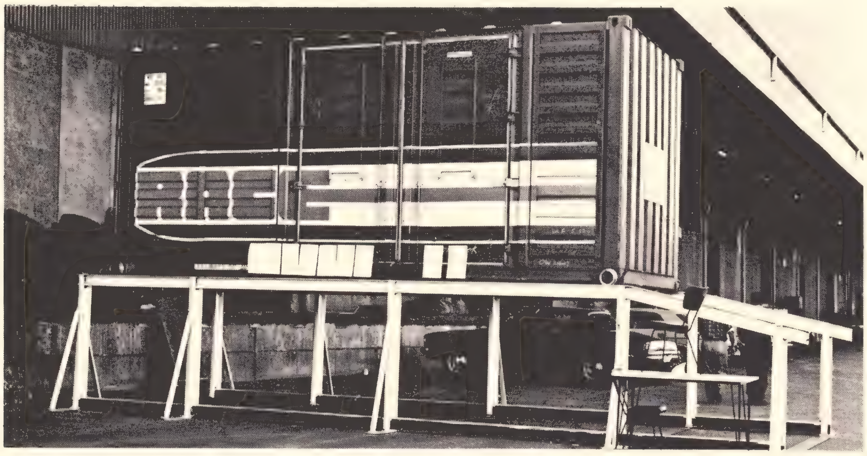
The "Drum Lifta" is a simple but effective attachment which clamps on to the tines of a forklift and lifts

VicRail's "Prairie wagon" — the cover folds as it slides along the length of the wagon.

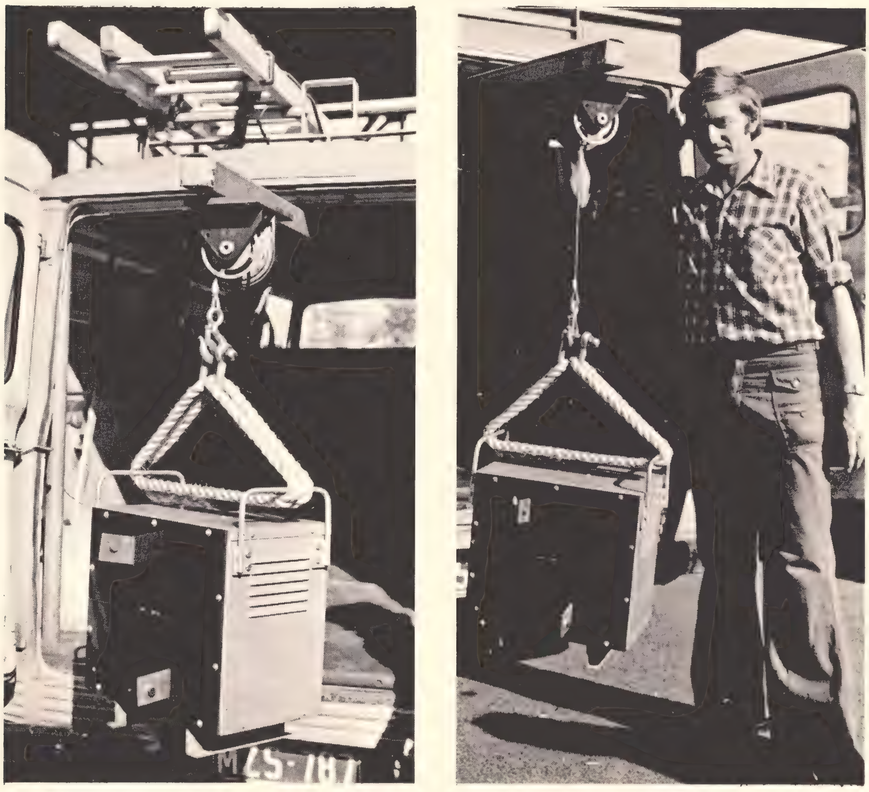




A light-weight lifting buggy which allows one man to lift 200 kg weights for use with the weighbridge.



A simple frame on which a truck leaves the container while it does another job. The container is packed, ready to be taken off, when the truck returns.



The hoist (left), designed by VicRail's electrical engineers, can swing equipment up to 750 lbs from the van and lower it gently to the ground.

a 44-gallon drum with ease, looking very much like a large can-opener.

The most popular item of equipment and one that most of the spectators had to try for themselves was the Jolosapede, a hydra-lift boom ladder. Australian-designed and built by Tolanco, the Jolosapede was originally designed to take the time and energy out of orchard work, but, it is now found to be equally at home in building maintenance, painting, pruning and cleaning.

A Rapier crane from Noyes Bros. also showed its paces. It has a load-carrying deck, first-class visibility from a well-placed operator's cab, and can turn in a 5.18 metre radius.

New-style industrial and commercial cleaners attracted a good deal of attention. Looking rather like a domestic lawn mower, the smallest model had no engines or batteries — a completely silent running piece of equipment. Large types had vacuum attachments, and on some the operator was seated. They were built on the principle of the large street cleaners, the round brush in front cleaning flush to the walls, pushing refuse into the main brush system.

The audience was impressed with the simplicity of the ingenious lift designed in VicRail and used to raise loads of 200 kg for a weigh bridge. A simple frame, two rubber wheels and a long balanced handle, and a difficult job becomes simple for one man. Also from VicRail, the cable cradle enabled a large drum of cable to be manoeuvred with ease.

The VicRail post digger showed how easy it has become to plant posts. A large crane has a screw post digger attached which, having done its job, folds neatly to the side of the crane, while the steel cable and hook runs out to lift the post into the prepared hole, saving many hours of back-straining effort.

Some of VicRail's latest maintenance trucks ended the display. These are designed with two sets of wheels, one for running on the road and the other for running on the train tracks. These will ultimately be used for maintenance work in the tunnels of the Melbourne Underground Loop Railway.

Track Maintenance for Faster, Heavier Trains

The British High Commission, Canberra, has released a bulletin outlining more recent major developments in track maintenance on British Rail. These developments are summarized below.

Acute problems of track maintenance have arisen for almost every railway system. Railways around the world are running heavier and faster trains, and heavier freight trains in particular, increase a railway's productivity; in many cases, as with such minerals as coal and iron ore, only rail can transport the huge quantities involved.

Several railways have been built or are under construction to take mineral resources to processing plants or to coastal ports, and speeds of up to 90 km/h are regularly achieved by trains weighing many thousands of tonnes.

In passenger transport, speed is the key factor in the railway's ability to compete with road and air. Modern motive power has brought dramatic increases in average speeds, the fastest passenger trains averaging more than 160 km/h and achieving top speeds of 200 km/h.

Revolution in Track Construction

But whether a railway is operating heavy freight or high-speed passenger trains, one factor remains constant — the need for high-quality track. In Britain, the last twenty years have seen a revolution in track construction. The traditional short length of rail, mounted in chairs and spiked to wooden sleepers, has been replaced by continuously welded rail in lengths of a kilometre or more, held directly on to concrete sleepers by rail clips.

It is the durability and high standards of alignment of such track that have made possible the highly intensive working now common on so many of the lines of British Rail. On one route, for example, 3000-tonne trains of 25-tonne axle-load wagons share the same tracks as the latest 200 km/h high-speed trains.

(a) The concrete sleeper

The concrete sleeper is the starting point for the improved permanent way. Compared with traditional timber sleepers, concrete sleepers have a longer service life, cost less to maintain, give greater track stability, and maintain the gauge more accurately.

In addition, provided the initial technical expertise is available, they can be manufactured anywhere. This is of particular importance to countries that must import the correct grade of timber for sleepers, or wish to make more profitable use of limited timber reserves.

There now are more than 20 million prestressed concrete sleepers in British Rail track alone. In addition, more than thirty countries have drawn on British manufacturers' expertise in setting up concrete sleeper manufacturing units. This assistance has ranged from advice on adapting existing concrete plant for sleeper production to the design and provision of a new sleeper factory as a turnkey project, including the training of the engineers.

(b) Replacement of chairs

The Pandrol clip, which can be used to secure rails to all types of sleepers, is now a familiar sight not only on British Rail but on at least fifty systems. This apparently simple piece of bent steel rod is, in fact, an advanced piece of engineering.

The steel is carefully selected and subjected to rigorous quality checks. Temperature control is critical during manufacture if the clip is to apply the correct pressure to the rail while retaining its resilience. After heat treatment, the distinctive shape is formed using precision jigs.

The Pandrol clip is particularly important where continuous welded rail is used, since the clips must restrain the tendency of the rails to expand and contract as the temperature changes. The two clips on either side of the rail are opposed, to restrain creep in both directions. Nor can creep dislodge the clips, because the force holding them to the sleepers is several times the force on the rail foot. As a result rail location is positive and permanent.

Yet the clips can be applied simply, with a hammer, and a mounted hydraulic system has been developed that makes application even easier. The clip is claimed to be the simplest and most cost effective rail fastening yet devised.

It has been standard equipment on British Rail since 1965 and several countries now manufacture Pandrol clips under licence, including Australia, India, Finland, Canada and Mozambique. This year Pandrol's overseas sales won for the company the Queen's Award for Export Achievement.

(c) Rail-making technique

This year also marks the 100th anniversary of steel rail manufacture at what are now the Workington works of the British Steel Corporation. Workington, in northwest England, is Britain's leading exporter of steel rails and related equipment.

Rails of course are produced to the material specifications and the profile laid down by the engineers of the purchasing railway. However, within this specification there is ample scope for a manufacturer to produce a product with a superior consistency or finish.

Workington rolls its rails from billets produced at Teeside in northeast England. These billets are continuously cast from steel produced by the basic oxygen process, which results in much improved quality and consistency; and a new straightening machine at Workington gives the finished rails an even higher degree of accuracy.

Track Inspection and Maintenance

Intensive operation demands a high standard of track but as it is achieved, it leaves very little time for routine inspection and maintenance; and the introduction by British Rail of the world's first 200 km/h diesel-powered passenger trains in 1976, accompanied by the upgrading of track alignment on the routes concerned, produced a challenging track testing problem. While suitable testing and recording equipment had been in use for many years, some of it was limited to a maximum speed of 30 km/h. It was difficult, and soon became impossible to fit a slow testing train into the intensive high-speed traffic pattern.

British Rail's solution was to develop a completely new high-speed track recording coach, capable of running at 200 km/h as part of a regular high-speed train in passenger service.

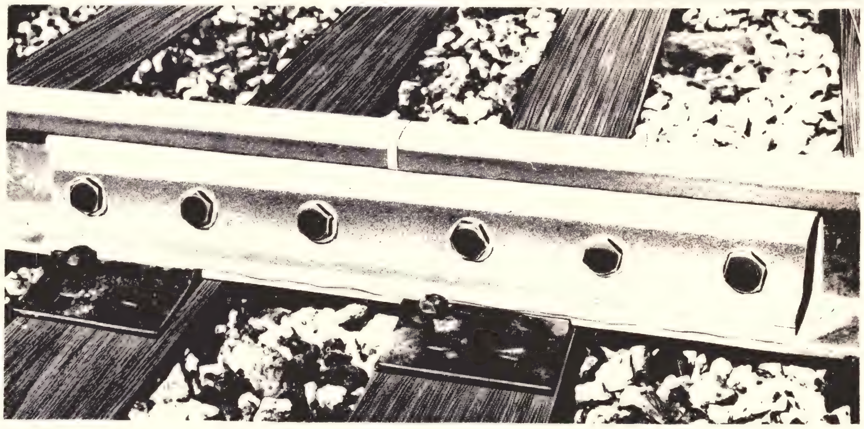
An important design consideration was that the equipment should be simple to maintain and operate, reliable and robust. For this reason non-contacting sensors are used in accelerometers, gyroscopes, and an optical gauge-measuring system that is accurate to within 3 mm.

The sensors measure six parameters — the vertical profile of each rail; the horizontal alignment; cross-level; curvature; track gauge; and the vertical slope, which shows up gentle undulations in the track. From these can be derived a number of other parameters, such as twist.

Defects Pinpointed by Computer

At 200 km/h, 5000 measurements are taken every second, and this data is processed by a microcomputer into tabular form for the track maintenance engineers, showing the average condition of 200 m sections of track, with a separate indication of particularly bad individual defects. Defects above a selected level also trigger a paint spray which marks the location of the defect on the track.

Complementing British Rail's high-speed test coach is the ultrasonic test train which checks the rails for cracks. These are likewise detected by computer analysis of the records.



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- Bonded with high-strength epoxy resin, developed by Portec, under "clean-room" conditions and accurate temperature control.
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ASSISTANT PRODUCT MANAGER TRANSPORTATION EQUIPMENT

Stone Platt Electrical (McColl) Pty Limited, an Australian subsidiary of a large UK group specialising in transportation equipment and supplying Australian and New Zealand Railways, require an assistant product manager — transportation equipment.

Candidates should have an engineering background with experience in railways' electrical/mechanical products, gained from previous employment with the railways, a rolling-stock builder or a traction equipement manufacturer.

The successful candidate is intended to subsequently move to the position as head of transportation department — sales/commercial experience would be an advantage.

The home base would be Melbourne but the position involves interstate and overseas travel. Age range up to 45.

An attractive salary, company car and superannuation are offered. Assistance with moving expenses would be considered.

Written applications, which will be treated in strictest confidence, should be addressed to:
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Managing Director,
Stone Platt Electrical (McColl) Pty Ltd,
P.O. Box 31,
Springvale. Victoria 3171

Vale — Geoff Fearnside

Railway Historian and Editor

It is with sincere regret that Railways of Australia *Network* records the passing of Geoff Fearnside, who was very well-known in railway circles throughout Australia.

As Managing Editor of Australian Universal Services Pty Ltd, Mr Fearnside was involved in the writing and publishing of *Network* from its inception in 1964 until the end of last year.

Mr Fearnside, a Sydney author and former journalist, was a recognised authority on railway affairs, having travelled widely by rail throughout Australia since 1958, when a series of writing assignments brought him into active contact, firstly with the New South Wales Railways, and later with the other systems.

During this long period he acquired an in-depth knowledge of railways, and in particular of the development of the Sydney/Perth standard-gauge line. One of his many books *All Stations West*, has been widely accepted as an authoritative account of the building of the trans-continental line across Australia.

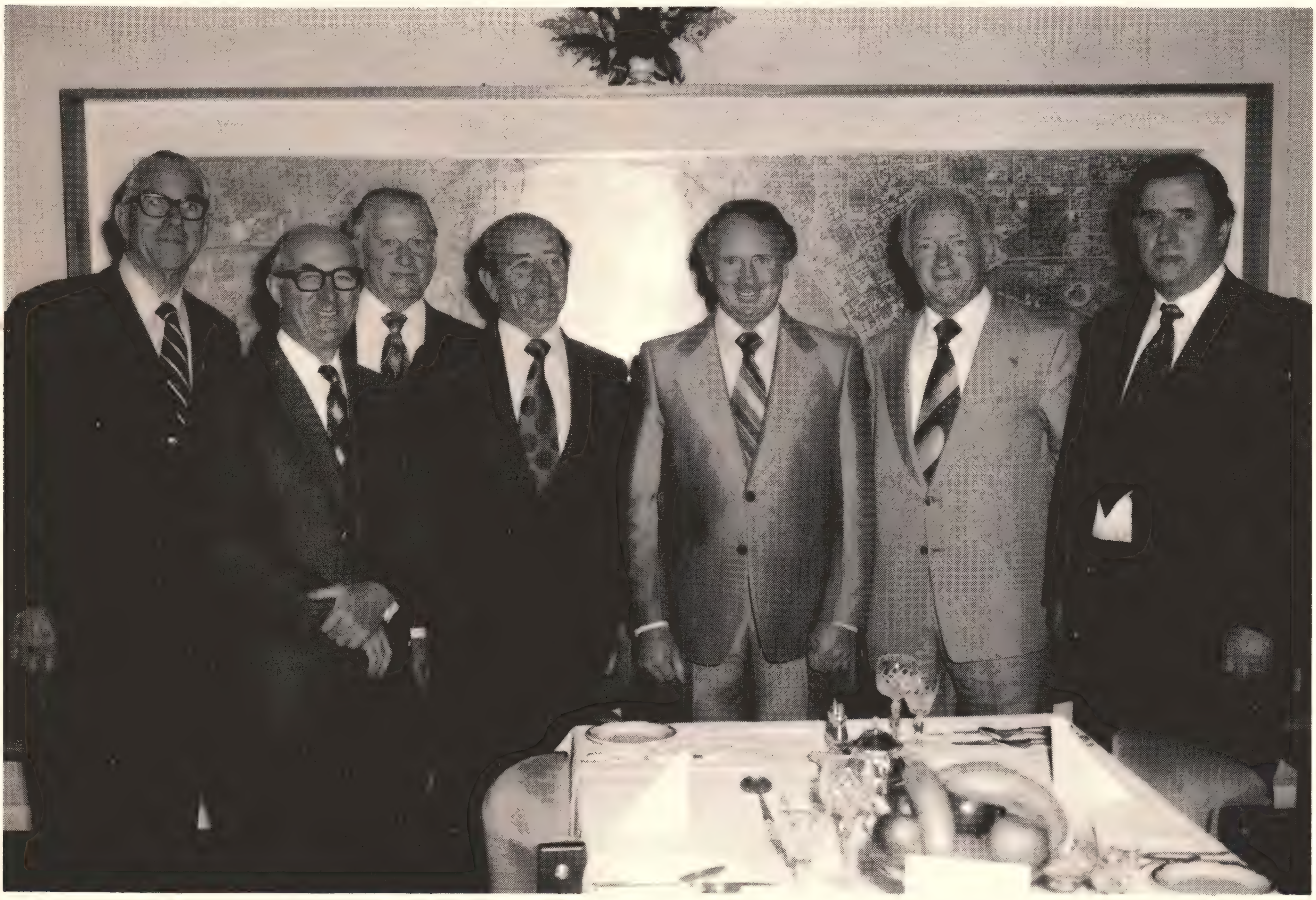
Railways of Australia *Network* extends its sincerest sympathy to his widow and two daughters on their very sad and untimely loss.

Commissioners Retire from Railways of Australia

The amalgamation of their respective systems with the Australian National Railways Commission has precipitated the retirement of Messrs G. T. Webb (Tasmania) and A. G. Flint (SA) as Commissioners of the Railways of Australia.

Mr G. T. Webb remains Chairman of the Tasmanian Transport Commission. Mr A. G. Flint remains Chairman of the South Australian State Transport Authority, and a Commissioner of the Australian National Railways Commission.

Chairman of Railways of Australia, Mr A. G. Gibbs, A.O., made a presentation of engraved gold cuff links to each retiring Commissioner after a meeting of Commissioners in Melbourne on Friday 28 April. In a brief presentation speech, Mr Gibbs expressed his appreciation of the contribution made to Railways of Australia by both retiring Commissioners.



Commissioners of the Railways of Australia *(left to right):* Messrs A. G. Gibbs, Chairman (Vic.); G. T. Webb (Tas.), retiring; P. J. Goldston (Qld.); K. A. Smith (ANR); A. G. Flint (SA), retiring; R. J. Pascoe (WA); and A. S. Reiher (NSW).

PTC Responsible for Rail, Bus and Ferry Services

"Queen Elizabeth II" at Circular Quay — the hub of PTC's rail, bus and ferry services.

In addition to the 9756 km rail network throughout New South Wales, the Public Transport Commission is responsible also for the provision of Government bus and ferry services in Sydney and Government bus services in Newcastle. This vast network of rail, bus and ferry operations has fixed assets valued at $1,245,233,000.

In addition to the many improvements being made to its rail services, the PTC is actively engaged on a $1000 million programme of improving all its services — whether on steel rails, on rubber tyres, or on water! Some indication of the massive expenditure can be gained from these examples:

★ A recent $40 million order for an additional 550 Mercedes-Benz buses is believed to be the biggest order ever placed for buses in the Southern Hemisphere and the second biggest order anywhere in the world. It follows an earlier order for 200 similar buses valued at $15 million.

★ Another hydrofoil has been imported from Italy at a cost of about $1 million.

★ Two more 570-passenger "Lady"-class ferries are to be built at the Newcastle State Dockyard at a total cost of $3.5 million.

In addition to the current $200 million track-upgrading programme, the infusion of this massive capital investment is clear indication of the firm commitment of the Government and the Public Transport Commission of New South Wales to improving the safety, reliability and comfort of all public transport services.

400th Double Deck Carriage in the Sydney Suburban Service

A milestone was reached recently by the Public Transport Commission of New South Wales with the introduction of its 400th double-deck carriage into the Sydney suburban service. Over one-third of the suburban train fleet now consists of double-deck carriages.

The proportion of double-deck to single-deck carriages will be increased further with the delivery of 34 more carriages from Commonwealth Engineering (NSW) Pty Ltd under a current contract for 100 units, to be followed by another 150 double-deck carriages being built in Newcastle by A. Goninan & Co Ltd under a $44 million contract. The first of these Newcastle-built carriages is due in July.

When these two big contracts are completed, double-deck carriages will make up nearly half of the PTC's total electric rolling-stock.

Double-deck carriages on the Sydney suburban network have proved extremely popular with commuters because of their many refinements, including air-suspension bogies, and, in particular, the 74 per cent increase in seating on an eight-car double-deck train as compared with a conventional single-deck consist.

Double-deck suburban train on the Sydney Harbour Bridge.

PTC Joins Wagon-Track Interaction Study

The Railways of Australia are currently engaged in nation-wide research of rail rolling-stock and their effect on rail track. Studies already made in South Australia by the Australian National Railways and the University of Adelaide are now being extended into NSW by the Public Transport Commission.

Allocation of funds by the Railways of Australia has enabled engineers and technicians from the Public Transport Commission's Way and Works and Mechanical Branches to join the study, in which computers will play an important role.

The basic objectives of the "task force" are:

★ To determine desirable and economical speeds for existing freight trains on existing tracks.

★ To determine characteristics for maximum economical operation.

★ To enable the South Australian results to be expanded for use on other systems.

★ To assist in assessing the life of the rail tracks. This will assist a longer-term study by Westrail.

Equipment to be used by the PTC in the study has already begun to be calibrated; a '422' Class locomotive was used for a static test on track at Redfern, field tests were carried out at Newcastle, and later tests will be conducted in country areas.

The project has been divided into three principal categories:

(1) Vertical force and track deflection tests.

(2) General testing of wagon characteristics.

(3) Lateral force and track deflection tests.

The immediate benefits anticipated from the study will be:

(1) Identification and improvement of track.

(2) Verification of the maximum speeds for freight wagons.

(3) Identification of factors which cause poor riding and track damage.

This is another example of the close liaison between the various railways systems of Australia in carrying out research for the ultimate benefit of all railways and the people they serve.

Fitting deflection sensors on a test wagon's axle boxes.

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Yesterday's track was fine for yesterday's trains. But the tracks are getting older and the trains are getting faster, and the two just don't go together anymore.

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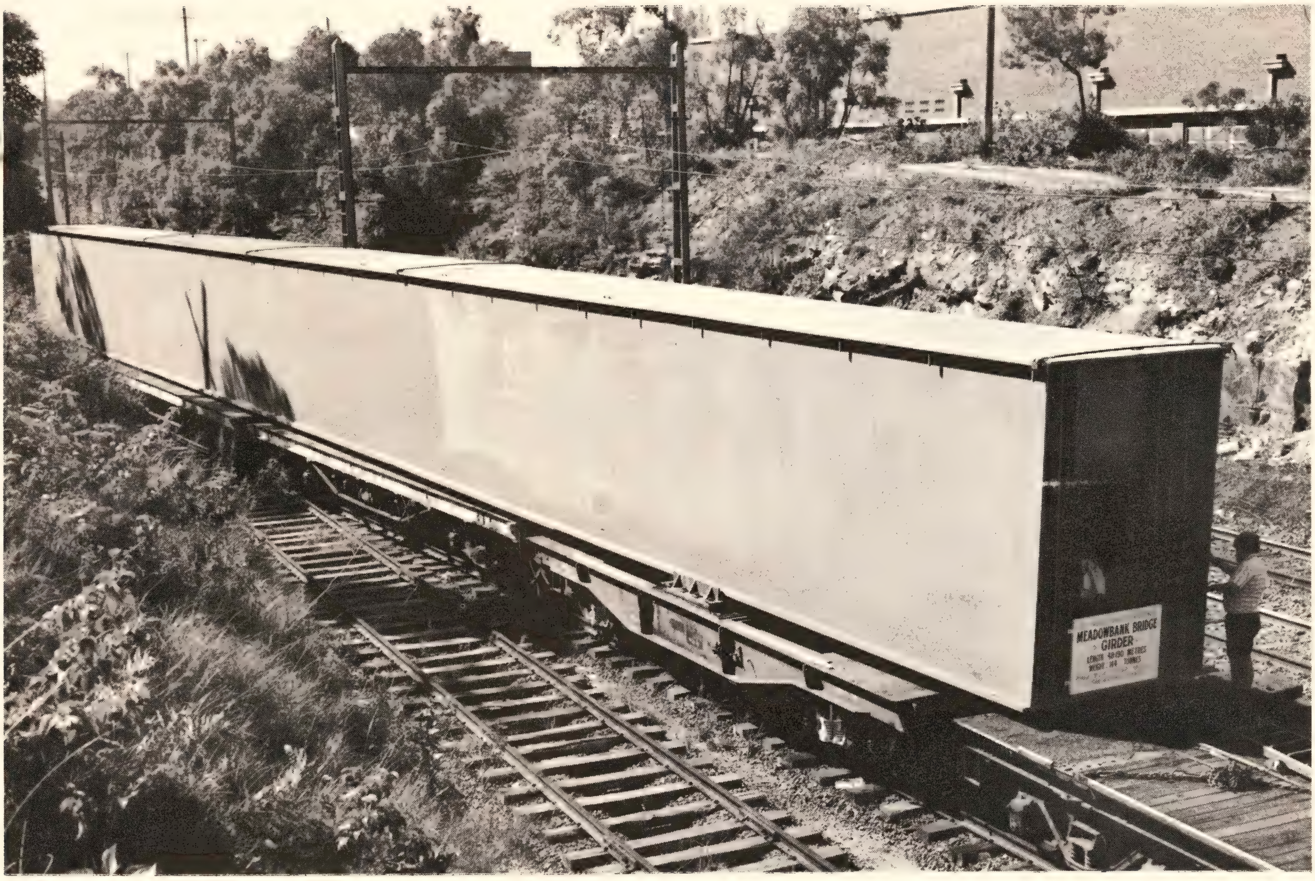


Australia's Biggest Out-of-Gauge Rail Load

On 30 April a special train left the PTC's Chullora Workshops conveying the first of ten box-type girders for use in construction of the $7 million bridge being built over the Parramatta River at Meadowbank.

The giant girder, designed and fabricated by PTC staff, weighed 144 tonnes, and was the biggest out-of-gauge load ever carried by rail in Australia — 48.19 metres (160 ft) long, 3.35 metres (11 ft) high, and 2.38 metres (7 ft 10 in) wide.

It had to be transported on specially strengthened wagons, and required exclusive use of both rail tracks for the whole route. At some locations overhead electrical wiring had to be lifted, at times using special 'skid pans' fitted to the girder. In addition, some signals were relocated to facilitate the movement.

The successful movement of this huge out-of-gauge load reflected great credit on staff liaison in all branches, which ensured that the record-breaking movement was completed so smoothly.

Similar arrangements will have to be made for the conveyance of the remaining nine girders.

New Sydney Suburban and Interurban Timetable

The new Sydney suburban and interurban timetable introduced on 27 May provides improved services, either through additional trains or increased seating capacity and improved reliability.

The delivery of double-deck carriages currently on order has made revision of the timetable possible, and the best use is being made of new rolling-stock.

The new timetable provides for:

★ Additional peak hour services.

★ Substantially increased seating capacity on 44 peak-hour rail trips by changes in the composition of train sets, making the best use of all available double-deck carriages.

★ Single-deck trains operating only in peak periods on Mondays to Fridays; double-deck trains at all other times.

★ Two-car double-deck trains running between Clyde-Carlingford; Hornsby-Cowan and Lidcombe-Liverpool-Campbelltown at times when passenger traffic does not warrant 4-car sets.

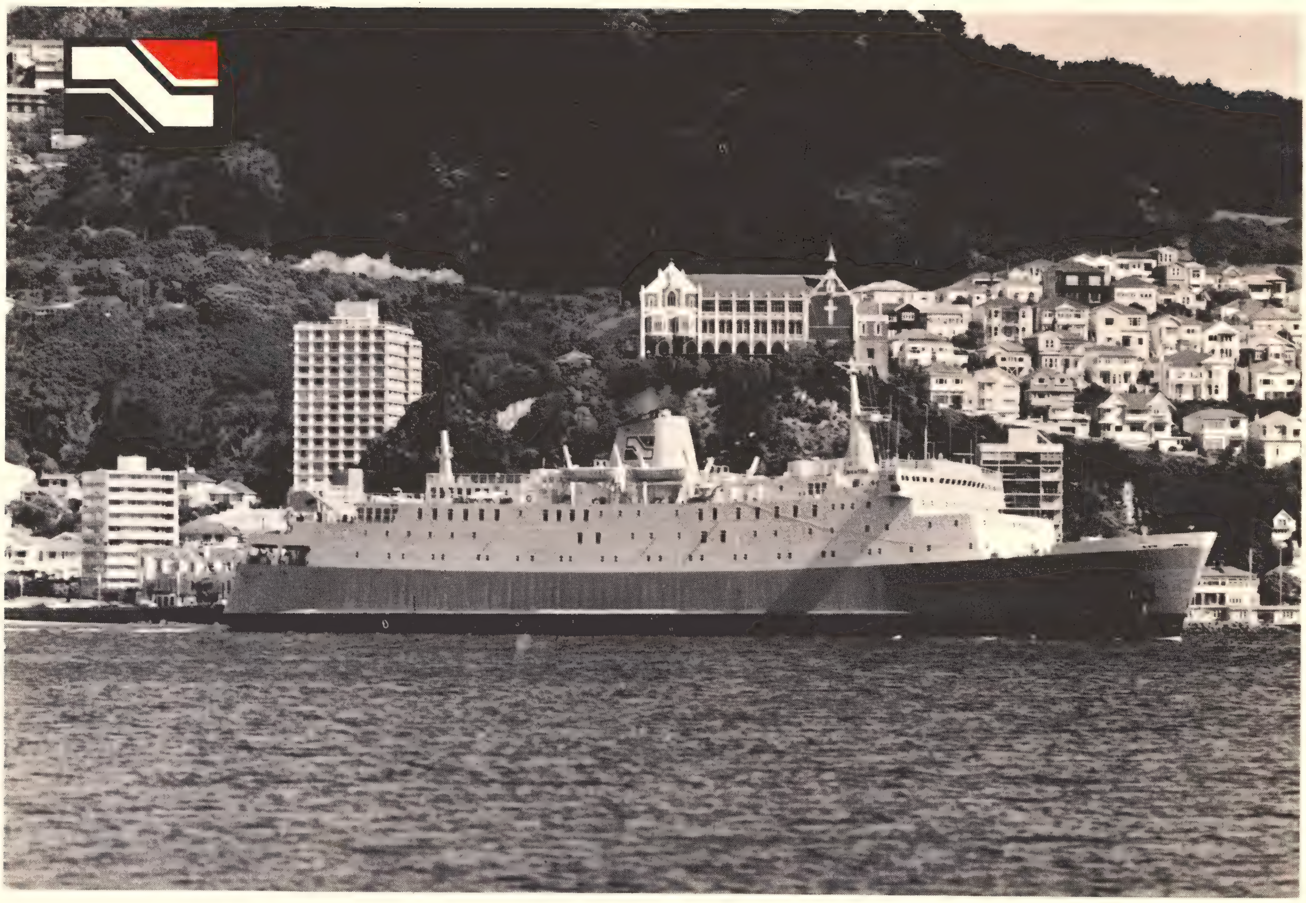
In addition to a new "Public" timetable containing schedules for all suburban and interurban lines, pocket timetables for individual routes were printed, as previously.

Pocket timetables are issued free but the "Public" book is sold for $1 — the same price as the previous issue.

First Suburban Station Escalators at Hurstville

Hurstville, a busy centre on the PTC's Illawarra Line, will be the first suburban station in New South Wales to be provided with escalators.

A contract has been let for provision of two escalators which will be placed on one side of the existing steps leading from Forest Road to the existing Upper Concourse. The cost, including site work is estimated at $310,000. The escalators should be in service by the end of October.



New Zealand Railways' Cook Strait ferry Aratika *sails between Wellington and Picton*

Refit for *Aranui* at Dunedin

New Zealand Railways' Cook Strait rail ferry, *Aranui,* is to undergo the major part of her refit in Dunedin, New Zealand. The Acting Minister of Railways, Mr McCready, said recently that the tenders were open only to New Zealand companies and the successful tenderer is Sims Engineering of Dunedin.

"The whole refit project will cost about $3 million and is one of the largest tasks of its type ever undertaken in New Zealand," he said. "It is being managed by Railways Department engineers and some work has already been completed since the vessel was withdrawn from service.

"The portion of the refit to be undertaken by Sims, in conjunction with A. and T. Burt and Naylor Love Construction, will cost approximately $2m and includes structural steel work and refurbishment of all public and crew accommodation. Overhaul of the electric machines is being carried out by Electrix Limited of Otahuhu.

"The whole project will provide valuable work and new experience for a number of New Zealand companies and will result in considerable savings in overseas funds." The vessel will be back in service for Christmas.

Tenders & Contracts

Tenders invited include:

PTC — Provision of Centralised Traffic Control on the North Coast of NSW between Telarah and Casino (Specification 360/78, closing 12 July).

PTC — Provision of a multi-channel Single Tube Coaxial Transmission System between Sydney, Chullora and Clyburn (Specification 462, closing 12 July).

Recent Contracts include:

WAGR — Re-sleepering and ballasting Kalgoorlie-Leonora railway: Caddy Pty Ltd ($1,457,731).

WAGR — 100,000 Pandrol plates: Wundowie Iron & Steel ($508,500).

WAGR — 11 Forklift Trucks: F.G.S. Datsun ($143,573).

WAGR — 48 Motor Trucks: Various firms ($488,007).

ANR — Manufacture of mobile camp accommodation units: Atlas Industrial Housing Pty Ltd ($134,770).

QR — Manufacture and delivery of fifteen class MO molasses wagons: Industrial Engineering Ltd, Indeng Fabrications (Qld) ($405,159).

QR — Manufacture and delivery of 1978/79 requirements of headgear: Mountcastle Pty Ltd ($109,331).

QR — Supply and delivery of 75,000 cubic metres of prepared stone ballast for the Norwich Park Project: Mt Peter Contractors ($442,500).

QR — Supply and delivery of prepared paints for 2-year period ending 31 March 1980: Dulux Australia Ltd ($112,977).

Free Champagne on the Nullarbor Trains!

This is not a "gimmick" headline. Free champagne will actually be served in the dining-car on Australia's famous "Indian-Pacific" and "Trans-Australian" services all next month, July 1978. For patrons who prefer them, other non-alcoholic beverages will also be made available without charge.

The champagne will be McWilliams' "Mark View", which has just been released to the Australian market. Connoisseurs who sampled McWilliams' latest release said it was true champagne designed to satisfy both male and female palates, being not too dry or too sweet. The name "Mark View" comes from McWilliams' oldest vineyard in Junee, New South Wales.

Train travellers will have ample opportunity to enjoy McWilliams' latest offering as it will be served at dinner each night.

The South Australian Government has ordered 30 diesel multiple-unit cars from Comeng Aresco Pty Ltd to begin replacement of Adelaide's ageing suburban rolling-stock. They comprise 12 diesel-hydraulic power cars and 18 trailers, all with elevated driving cabs at one end. The former have been designed for easy conversion to electric traction should electrification of Adelaide's suburban lines be approved.

* * *

The PTC's Sydney Area Re-signalling Project *(see February issue)* advanced a further stage recently with the letting of a $14 million contract to Westinghouse Brake and Signal Co (Aust) Pty Ltd. This is part of an overall $30 million computerised train-describer system which will revolutionise signalling procedures in the Sydney/Strathfield area, the hub of the PTC's extensive rail operations.

Transport Outlook Conference

Canberra, 19-20 September

The Commonwealth Record for 8-14 May 1978 reported an announcement by the Minister for Transport, the Hon P. J. Nixon, that more than three hundred of Australia's leading decision makers from all areas of transport — land, sea and air — would be invited to meet in Canberra on 19 and 20 September. The meeting, the second Transport Outlook Conference, organized by the Bureau of Transport Economics, would be a forum for governments and industry to discuss the future of transport in Australia.

Mr Nixon expressed the hope that the conference would build on the improved understanding between governments and industry which resulted from the first Transport Outlook Conference held in July 1975. Emphasising that transport is Australia's biggest service industry, employing about a quarter of a million people, and that transport, storage and communication account for about 25 per cent of gross national expenditure, he outlined the conference programme:

The Bureau of Transport Economics will set the stage for discussions on the first day of the conference by presenting papers dealing with the outlook for Australia's freight and passenger services. This will be followed by a symposium on government regulation in transport, in which discussion will be lead by a panel of prominent transport personalities.

The morning of the second day will consist of five market segment sessions — each running concurrently and including a paper by a leader in a field of transport. These sessions will deal with urban passenger services, non-urban domestic passenger services, international passenger services, bulk freight and consolidated and general freight services. In the afternoon, the conference will conclude with a review of the issues raised during the preceding discussions.

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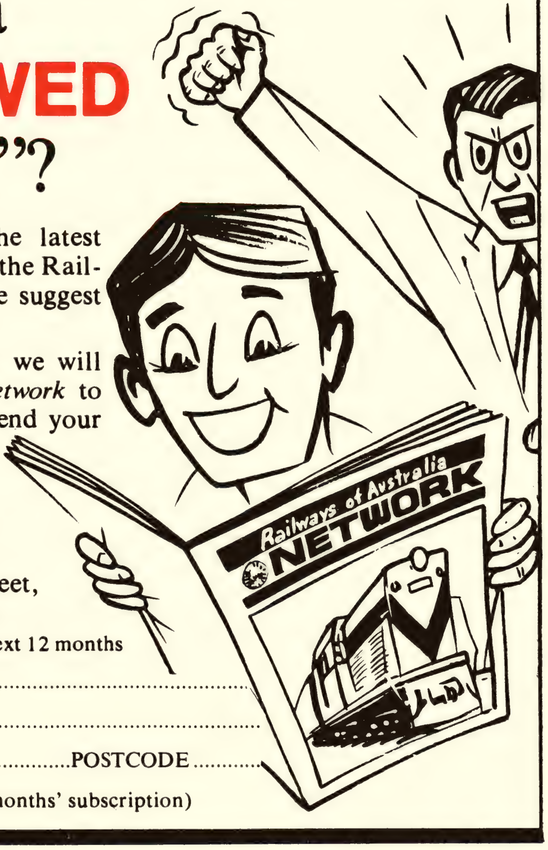

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QLD.: Queensland Railways: 225 1218
S.A.: Australian National Railways: 267 4300
TAS.: Australian National Railways (Tas Region): Hobart 38 9286
VIC.: VicRail: 62 0061
W.A.: Westrail: 326 2811

ROA

Railways of Australia

The Window Seat

The Institution of Railway Signal Engineers (Australian Section) recently held its 30th Annual General and Technical Meeting in Melbourne at the Railway Education Centre, Princes Bridge Station. The chairman, Mr H. E. McCamley, reported a continuing increase in membership, from 125 in 1976 to 143 in March 1978, and three very successful technical meetings held during 1977.

The Institution was honoured by the presence of Mr A. G. Gibbs, A.O., chairman of the Victorian Railways Board, who subsequently addressed the meeting on "Aspects of Melbourne's Level Crossing Problems". In it he traced the development of level-crossing protection services from the simple wig-wag signal of 1923 to the sophisticated power signalling of today.

Expressing deep concern at the all too frequent disregard of signs and warnings at level crossings by both car and heavy transport drivers, he praised the research being undertaken into level-crossing problems by the Institution's Signal and Communications Division.

Papers were presented on "Human Factors and Road-Rail Protection" by Mr J. J. Cox, and "Special Design Features used in Level-Crossing Protection" by Mr G. J. McNamara.

Immediately after the Annual Meeting, many members and visitors travelled to Launceston for the Tasmanian section of the Annual Convention, during which two further technical papers were presented: "Signalling in the Tasmanian Region of Australian National Railways" by Mr R. E. Leslie, and "The Larse Supervisory System as Installed in the Tasmanian Region", by Mr W. Wapshott.

* * *

The April issue of *International Railway Journal* reports substantial progress in two independent developments of self-steering bogies, which allow axles to align themselves radially with track curves.

Two Australian companies are said to have agreed to joint production of a self-steering bogie designed by South African Railways engineer, Herbert Scheffel, and a license is being negotiated for a US supplier. Intense South African interest in the project arises from the fact that high-load ore trains on the SAR 1065 mm gauge have created exceptional problems of rail and flange wear, much of which the new bogie is expected to eliminate.

It will also make possible much higher speeds than the narrow gauge has hitherto permitted. For SAR, general introduction of the Scheffel bogie is now an important immediate objective.

Meanwhile, a new type of self-steering bogie has been developed in Canada by Railway Engineering Associates and Canadian National Rail. CN's chief of technical research claims a 60% reduction in flange wear and up to 75% reduction in the angle of attack between flange and rail. The inventor, Mr Harold List, claims that the benefits of the new bogie can be applied readily to many existing roller-bearing wagons.

Production units have been tested and will go into service evaluation on coal trains between Jasper and the Pacific Coast, an 880 km route with many curves.

Annual savings in wheel and rail maintenance on this route are estimated at $950 per wagon, with an additional saving of $225 per wagon annually in friction drag. Savings over 18-24 months are expected to meet the cost of refitting a conventional wagon with the new bogie.

* * *

Railway Gazette International reports that British Rail's 1978-79 timetable sees the first regular 200 km/h running on the East Coast main line. The *Flying Scotsman* completes the 632 km journey from Edinburgh to London in 4 hours 50 minutes at an average speed of 131 km/h with one stop. This is a saving of 38min over the previous best time.

* * *

It also reports that following an investigation commissioned jointly by Coras Iompair Eireann and Northern Ireland Railways, many improvements have been recommended in the 181 km Dublin-Belfast cross-border main line. Principal recommendation is track upgrading to raise maximum speed from the present 110 km/h to 145 km/h, together with an increase in through passenger trains from four to ten per day. The line carries very little freight.

Following approval by the British and Irish governments, an application will probably be made for grants from EEC funds to cover half the capital cost.

* * *

CP Rail News reports that Canadian Pacific has ordered 25 3000 hp SD40-2 diesel-electric locomotives, valued at more than $18 million, from General Motors of Canada Ltd. Measuring 70 ft in length and weighing 195 tons, these six-axle units will be used in general freight service across the CP system.

They will increase CP's locomotive roster to over 1300 diesel units. These include 354 of the SD40 model, acquired since 1966, of which 289 are of the SD40-2 model, with advanced electronic systems.

This latest order, scheduled for completion between November 1978 and January 1979, will provide no less than 2250 man-years of employment at the GMC Diesel Division, London, Ontario.

* * *

Six new heavy-duty shunting locomotives have arrived in New Zealand from the United States. Purchased from General Electric for $3 million, they will be used on the Auckland suburban shunter services, where their capabilities and their performance will be assesed.

Weighing 54,400 kg (119,400 lb), the new Dh locomotives are 10,324 mm (33 ft 6 in) long and 3670 mm (12 ft) high. The Caterpillar D398 900 horse-power engine can attain a top speed of nearly 90 km/h (55 mph) and has a starting tractive effort of 160 kilonewtons.

* * *

The NSW State Government has allocated $20 million to replace all timber rail bridges on the PTC's North Coast line over the next seven years. There are 357 timber bridges between Maitland and Grafton which are to be replaced with steel structures.

Contracts have already been let for a bridge at Gloucester and another at Warrell Creek, both of which should be in service by next June. Four other bridges on the Yumbunga-Bulliac section will be replaced early in 1979.

Clark Equipment Australia Ltd has announced a shorter overall-length unit as an optional configuration of the C500 80 lift truck, a cushion-tyred vehicle with a rated capacity of 8000 lb (3650 kg) at 24″ (600 mm) centres.

The shorter wheel-base (1473 mm) reduces the overall length of the machine by 314 mm to 2216 mm, and the turning radius by 214 mm to 2013 mm, with obvious advantages when operating in congested areas, especially with attachments, increased load size or higher stacking heights. To further simplify manoeuvring, power steering is standard.

The C500 80 is powered by a 6-cylinder Continental petrol or LP gas engine, and features 2-speed powershift constant-mesh transmission.

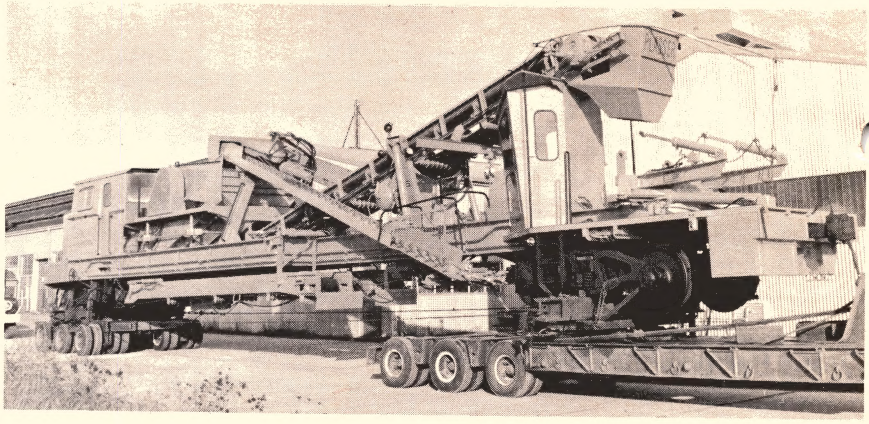
* * *

A new service has just been introduced by the Public Transport Commission of NSW in conjunction with Cobb & Co providing comfortable co-ordinated rail/coach travel between Sydney and Casino, the Gold Coast, Brisbane and the Sunshine Coast to Noosa.

The co-ordinated service operates daily in both directions on "Brisbane Limited" in comfortable "Day-Niter" seats, with Casino as the interchange point between rail and coach. Gosford and Newcastle passengers can also use the new service. Cobb & Co coaches provide the road link between Casino and the resorts.

* * *

Better riding for "Indian-Pacific" passengers is assured by the completion of continuous welded rail between Cookamidgera to Parkes, and similar work has been started in the Goobang Junction — Bogan Gate and the Bathurst-Orange sections.



A new ballast-cleaning machine and ancillary equipment, costing $750,000 has just been delivered to the Public Transport Commission of New South Wales. It will be placed in service on track ballast rehabilitation between Woy Woy and Gosford on the busy Main units still to come, will assist greatly in the Public Transport Commission's $200 million track-upgrading project.

Since May 1976, ballast has been cleaned over 80 kilometres of track in the Blue Mountains, Central Coast and other areas.

With the aid of Commonwealth Government assistance under the Transport (Planning and Research) Act, the Public Transport Commission has recently purchased a Scanning Electron Microscope valued at $120,000. This sophisticated instrument, which magnifies up to 180,000 x, has greatly increased the scope of metallurgical and chemical work within the PTC.

Because the microscope is extremely sensitive to vibration at high magnification, great care was taken in its installation. It sits on a fully independent concrete-block base about 1 m thick which permits, even at the highest magnification, excellent vibration-free images. Initial use will be for extensive investigations into wheel metallurgy.

* * *

New freight facilities at Cowra, NSW, are nearing completion and will provide improved freight services in the surrounding district. On a recent northern visit, the NSW Premier announced that Casino will get a $200,000 bulk-freight terminal in the 1978/1979 financial year. He expected that site works would start within two months, tenders to be called in June for construction of the terminal which will be in the goods yard at Old Casino.

* * *

A selection of holidays in northern New South Wales and Queensland specially suited to sporting groups has been recently developed by the Public Transport Commission of NSW. Big discounts are offered to groups of twenty or more, the organiser of each group receiving a complimentary holiday. Part of the "package" is $100 for end-of-tournament trophies as a gesture by the PTC towards fostering sport or, alternatively, the money can be used for a "Farewell Dinner".

These special tours for sports or health groups, which visit Sawtell and Grafton in NSW and Buderim in Queensland, are fully explained in a special brochure "Holidays for Sports Groups".

* * *

VicRail's suburban tickets, other than single and return tickets to Flinders Street or Spencer Street in Melbourne, which will still show their destination, are to show a zone number instead of a destination station — like the off-peak zone-numbered tickets which have been in use since July 1976. Weekly tickets to all stations will also remain unchanged.

A zone number represents a group of stations that have an identical fare. This enables one ticket issue to serve all stations that have a fare of, say, 50c instead of the multitude of tickets required to serve every station on the suburban network.

The smaller range of tickets required at each station makes possible economies in printing and distribution, and all stations will have a printed ticket to almost every station in the suburban area. Booking staff will no longer have to write ordinary suburban single and return tickets, and inadvertently delay passengers.

The new zone tickets will be introduced progressively over the next 12 months.

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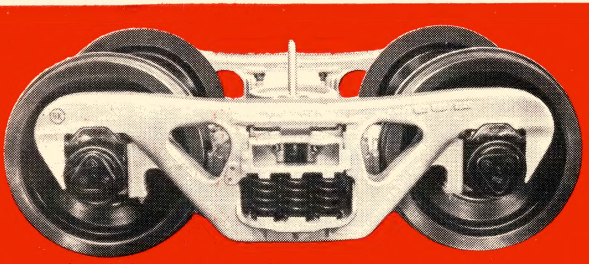

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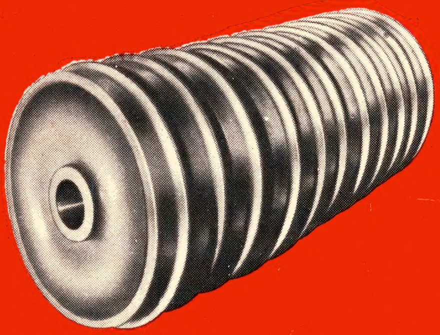

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